TEST REPORT

Report Number : 13911916-E7V2

Applicant	:	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	:	A2595
Brand	:	APPLE
FCC ID	:	BCG-E4082A
IC	:	579C-E4082A
EUT Description	:	SMARTPHONE
Test Standard(s)	:	FCC CFR47 PART 22H, 24E, AND 27L ISED RSS-GEN ISSUE 5, RSS-132 ISSUE 3, RSS-133 ISSUE 6, AND RSS-139 ISSUE 3

Date Of Issue:
FEBRUARY 04, 2022

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ACCREDITED
CERT #0751.05

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	1/21/2022	Initial Review	Mengistu Mekuria
V2	2/4/2022	Revise section 8 and 9.1	Mengistu Mekuria

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1. ATTESTATION OF TEST RESULTS

Applicant Name and Address	APPLE, INC. 1 APPLE PARK WAY CUPERTINO, CA 95014, U.S.A.
Model	A2595
Brand	APPLE
FCC ID	BCG-E4082A
IC	579C-E4082A
EUT Description	SMARTPHONE
Serial Number	FG114320MPR17XR9N (Conducted) AND G2HG2D1Q9D (Radiated)
Sample Receipt Date	SEPTEMBER 08, 2021
Date Tested	SEPTEMBER 15, 2021 TO JANUARY 14, 2022
Applicable Standards	FCC CFR 47 Part 2, Part 22, Part 24, and Part 27 ISED RSS-GEN ISSUE 5, RSS-132 Issue 3, RSS-133 Issue 6, RSS-139 Issue 3.
Test Results	COMPLIES

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released By:	Reviewed By:	Prepared By:
Mengistu Mekuria Staff Engineer UL Verification Services Inc.	John Thompson Test Engineer UL Verification Services Inc.	Tewodros Woldemichael Senior Laboratory Technician UL Verification Services Inc.

2. SUMMARY OF TEST RESULTS

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

Requirement Description	Requirement Clause Number (FCC)	Requirement Clause Number (ISED)	Result	Remarks
RF Conducted Output Power	2.1046, 90.635 (b)	-	Complies	
Effective Radiated Power	22.913 (a)(5)	-	Complies	
Equivalent Isotropic Radiated power	24.232 (c), 27.50 (d) (4)	RSS132§5.4 RSS133§6.4 & SRSP-510, 5.1.2 RSS139§6.5	Complies	
Occupied Bandwidth	2.1049	RSS132 RSS133§2.3 RSS139 RSS-GEN§6.7	Complies	
Band Edge and Emission Mask	2.1051, 22.917 (a), 24.238 (a), 27.53 (h),	RSS132§5.5 RSS133§6.5 RSS139§6.6	Complies	
Out of Band Emissions	2.1051, 22.917 (a), 24.238 (a), 27.53 (h),	RSS132§5.5 RSS133§6.5 RSS139§6.6	Complies	
Frequency Stability	2.1055, 22.355, 24.235, 27.54, 90.213	RSS132§5.3 RSS133§6.3 RSS139§6.4	Complies	
Peak-to-Average Ratio	22.913 (d), 24.232 (d), 27.50 (d) (5)	RSS132§5.4 RSS133§6.4 RSS139§6.5	Complies	
Field Strength of Spurious Radiation	2.1053, 22.917 (a), 24.238 (a), 27.53 (h),	RSS132§5.5 RSS133§6.5 RSS139§6.6	Complies	

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with the following:

- ANSI C63.26:2015
- FCC CFR 47 Part 2, Part 22, Part 24, and Part 27
- FCC KDB 971168 D01 v03r01: Power Meas License Digital Systems
- FCC KDB 971168 D02 v02r01: Misc Rev Approv License Devices
- FCC KDB 412172 D01 v01r01. Determining ERP and EIRP
- ISED RSS-GEN Issue 5, RSS-132 Issue 3, RSS-133 Issue 6, RSS-139 Issue 3.

4. FACILITIES AND ACCREDITATION

UL LLC is accredited by A2LA, certification #0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☒	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
☒	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA	US0104	22541	550739
☐	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA	US0104	2324B	550739

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{Lab}
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.84 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB
Occupied Channel Bandwidth	±1.22 %
Temperature	±2.26%
Supply voltages	±0.57 %
Time	±3.39 %

Uncertainty figures are valid to a confidence level of 95%.

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

The Apple iPhone is a smartphone with multimedia functions (music, application support, and video),cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G FR1, IEEE 802.11a/b/g/n/ac/ax, Bluetooth, GPS and NFC. All models support at least one UICC based SIM. The second SIM is an UICC based e-SIM (electronic SIM) in some models. China model has 1 p-SIM only. The device supports a built-in inductive charging receiver. The rechargeable battery is not user accessible.

Testing was performed on the parent model and is used to support the application for the parent and variants identified in this report based on the test plan submitted and approved via KDB inquiry by the FCC and by ISED-Canada.

6.2. MAXIMUM OUTPUT POWER

EIRP/ERP TEST PROCEDURE

ANSI C63.26:2015
KDB 971168 D01 Section 5.6

ERP/EIRP = PMeas + GT − LC
where: ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMeas, typically dBW or dBm);
PMeas = measured transmitter output power or PSD, in dBm or dBW;
GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

For devices utilizing multiple antennas, KDB 662911 provides guidance for determining the effective array transmit antenna gain term to be used in the above equation.

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted and ERP/EIRP output powers as follows:

GSM MODES

RSS 132 850MHz (Ant 1)								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
824.2-848.8	GPRS	33.28	-1.60	11.5	31.68	1.472	245.25	245KGXW
	EGPRS	28.11			26.51	0.448	242.18	242KG7W
Part 22 850MHz (Ant 1)								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	ERP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
824.2-848.8	GPRS	33.28	-1.60	7.0	29.53	0.897	245.25	245KGXW
	EGPRS	28.11			24.36	0.273	242.18	242KG7W
Part 24 / RSS 133 1900MHz (Ant 1)								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
1850.2-1909.8	GPRS	30.50	1.90	2.0	32.40	1.738	249.11	249KGXW
	EGPRS	26.90			28.80	0.759	243.03	243KG7W

WCDMA MODE

RSS 132 Band 5 (Ant 1)								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
826.4-846.6	REL 99	25.70	-1.60	11.5	24.10	0.257	4153.4	4M15F9W
	HSDPA	24.79			23.19	0.208	4152.2	4M15F9W
Part 22 Band 5 (Ant 1)								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	ERP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
826.4-846.6	REL 99	25.70	-1.60	7.0	21.95	0.157	4153.4	4M15F9W
	HSDPA	24.79			21.04	0.127	4152.2	4M15F9W
Part 24 / RSS 133 Band 2 (Ant 1)								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
1852.4-1907.6	REL 99	25.70	1.90	2.0	27.60	0.575	4151.1	4M15F9W
	HSDPA	24.73			26.63	0.460	4159.6	4M16F9W
Part 27 / RSS 139 Band 4 (Ant 1)								
Frequency range (MHz)	Modulation	Conducted (Average) (dBm)	Antenna Gain (dBi)	Limit (W)	EIRP		99% BW (kHz)	Emission Designator
					(dBm)	(W)		
1712.4-1752.6	REL 99	25.70	0.80	1.0	26.50	0.447	4138.6	4M14F9W
	HSDPA	24.82			25.62	0.365	4061.1	4M06F9W

6.3. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was version: 0.13.02.

6.4. MAXIMUM ANTENNA GAIN

The antenna(s) gain and type, as provided by the manufacturer' are as follows:

Frequency Band	ANT 1 Antenna Gain (dBi)	ANT 2 Antenna Gain (dBi)
GSM850 and WCDMA 5 824 – 849MHz	-1.6	-4.0
GSM1900 and WCDMA 2 1850 – 1910 MHz	1.9	2.0
WCDMA 4 1710 – 1755 MHz	0.8	-0.1

6.5. WORST-CASE CONFIGURATION AND MODE

The EUT was investigated in three orthogonal orientations X/Y/Z on ANT 1 and ANT2 antennas to determine the worst case orientation. The following table exhibits the worst case orientation for different frequency bands. The full tests of the EUT have made upon the orientations that shown in the table below.

Frequency Bands	ANT1	ANT2
824 – 849 MHz	X	X
1710 – 1915 MHz	X	X

Based on average conducted output power measurement investigations. The worst-case is Ant1 with the highest power. Therefore, Ant 1 was used to perform all conducted tests.

The worst-case scenario for all measurements as followed:
- GSM GPRS
- GSM EGPRS
- WCDMA REL 99
- WCDMA HSDPA

Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. There were no emissions found with less than 20dB of margin from 9kHz to 1GHz.

For simultaneous transmission of multiple channels in the 2.4GHz/5GH WLAN, UWB, and Cellular bands, tests were conducted for various configurations having the highest power, least separation in frequencies and widest operation bandwidths. No noticeable new emission was found.

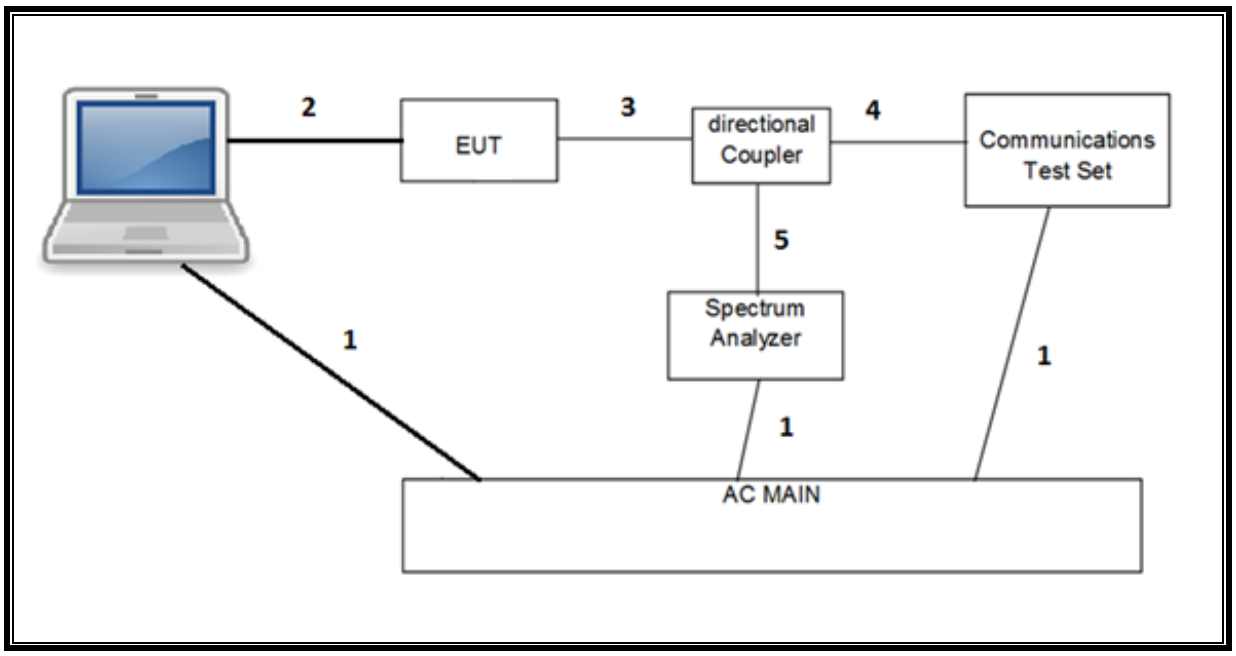
6.6. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT					
Description	**Manufacturer**	**Model**	**Serial Number**		**FCC ID/ DoC**
Laptop	Apple	MacBook Pro	QDS-BRCM1069		A1398
AC/DC adapter	Apple	B123	N/A		PA-1450-BA1

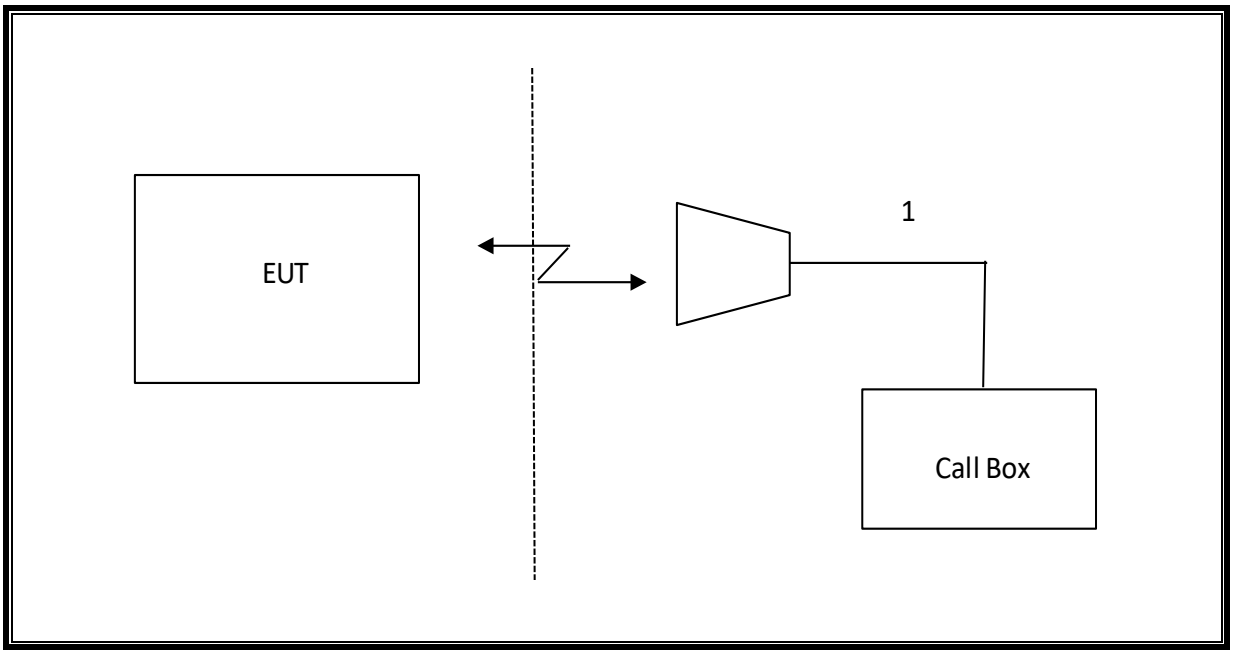
I/O CABLES (RF CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	3	US 115V	Un-shielded	2.0	N/A
2	USB	1	DC	Un-shielded	1.0	N/A
3	RF In/Out	1	EUT	Un-shielded	0.6	N/A
4	RF In/Out	1	Communication Test Set	Un-shielded	1.2	N/A
5	RF In/Out	1	Barrel	N/A	N/A	N/A

I/O CABLES (RF RADIATED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	RF In/Out	1	Antenna	Un-shielded	5.0	N/A

CONDUCTED SETUP



RADIATED SETUP



7. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Asset**	**Cal Due**
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T345	05/26/2022
Antenna, Horn 1-18GHz	ETS Lindgren	3117	T136	07/07/2022
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	T900	02/24/2022
Amplifier, 1 to 18GHz	Miteq	AFS42-00101800-25-S-42	T1165	06/12/2022
Spectrum Analyzer, PXA 3Hz to 44GHz	Keysight	N9030A	T907	07/22/2022
Spectrum Analyzer, PXA 3Hz to 50GHz	Keysight	N9030B	207995	05/27/2022
Spectrum Analyzer, PXA, 3Hz to 50GHz w/Ext. Mixer	Keysight	N9030A	T342	01/25/2022
Spectrum Analyzer, PSA 3Hz to 44GHz	Keysight	E4446A	T123	01/22/2022
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T964	02/17/2022
Wireless Communication Test Set, Call Box	Agilent	E5515C	T211	04/03/2022
Directional Coupler	KRYTAR	152610	T1161	09/23/2022
Directional Coupler	KRYTAR	152610	T1536	09/23/2022
Directional Coupler	KRYTAR	152610	T1537	09/23/2022
Power Meter, P-series single channel	Keysight	N1912A	T1272	01/21/2022
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight	N1921A	T1224	01/28/2022
Filter, HPF 3.0GHz	Micro-Tronics	HPM17543	T487	04/27/2022
Filter, HPF 1.2GHz	Micro-Tronics	152043	152043	07/29/2022
Filter, BRF 1850 – 1910 MHz	Micro-Tronics	BRM50714-02	T1796	06/10/2022
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	T1210	01/22/2022
Wideband Communication Test Set, Call Box	R&S GmbH & Co. KG	CMW500	T979	02/22/2022
Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	T754	06/16/2022
Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	T1154	06/15/2022
Amplifier, 26.5GHz to 40GHz	Miteq	NSP 4000 SP2	T88	04/22/2022
Amplifier, 1 to 26.5GHz, 23.5dB Gain minimum	Keysight	8449B	T404	04/19/2022
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	T447	04/22/2022
Antenna, Horn 26.5GHz to 40GHz	ARA	MWH-2640	T1864	04/19/2022
Spectrum Analyzer	Keysight	8564E	T106	01/27/2022
Antenna, Active Loop 9KHz to 30MHz	EMCO	PRE0154914	T1683	05/24/2022
UL AUTOMATION SOFTWARE				
CLT Software	UL	UL RF	Ver 3.4, June 08 2021	
Power Measurement Software	UL	UL RF	Ver 3.1.4, May 20, 2021	
Radiated test software	UL	UL RF	Ver 9.5 July 7, 2020	

NOTES:

* Testing is completed before equipment expiration date.

8. RF OUTPUT POWER VERIFICATION

EUT includes different power levels for head use configuration and body use configuration and the below tables contain the highest of all configurations average conducted output powers as follows:

GSM

Using CMW500 Communication Test Set
Function: Menu select > GSM Mobile Station > GSM 850/900/1800/1900

Press **Connection control** to choose the different menus
Press **RESET** > choose all to reset all settings

Connection	Press **Signal Off** to turn off the signal and change settings Network Support > GSM+GPRS or GSM+EGPRS Main Service > Packet Data Service selection > Test Mode A – Auto Slot Config. off	
MS Signal	Press Slot Config bottom on the right twice to select and change the number of time slots and power setting	
	> Slot configuration	> Uplink/Gamma > 33 dBm for GPRS 850/900 > 27 dBm for EGPRS 850/900 > 30 dBm for GPRS1800/1900 > 26 dBm for EGPRS1800/1900
BS Signal	Enter the same channel number for TCH channel (test channel) and BCCH channel	
	Frequency Offset >	+ 0 Hz
	Mode >	BCCH and TCH
	BCCH Level >	-85 dBm (May need to adjust if link is not stable)
	BCCH Channel >	choose desire test channel [Enter the same channel number for TCH channel (test channel) and BCCH channel]
	Channel Type >	Off
	P0>	4 dB
	Slot Config >	Unchanged (if already set under MS Signal)
	TCH >	choose desired test channel
	Hopping >	Off
	Main Timeslot >	3 (Default)
Network	Coding Scheme >	CS 1 (GPRS) and MCS5 (EGPRS)
	Bit Stream >	2E9-1PSR Bit Pattern
AF/RF	Enter appropriate offsets for Ext. Att. Output and Ext. Att. Input	
Connection	Press **Signal On** to turn on the signal and change settings	

RESULT

8.1.1. GSM 850

Test Engineer ID:	38602	Test Date:	9/10/2021

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Conducted Average Power (dBm)	
					ANT 1	ANT 2
GPRS (GMSK)	CS1	1	128	824.2	**33.28**	**31.80**
			190	836.6	33.22	31.66
			251	848.8	33.04	31.73
		2	128	824.2	33.27	31.53
			190	836.6	33.10	31.44
			251	848.8	32.91	31.46
EGPRS (8PSK)	MCS5	1	128	824.2	27.88	27.08
			190	836.6	**28.11**	**27.19**
			251	848.8	27.90	27.15
		2	128	824.2	27.97	26.04
			190	836.6	27.97	26.23
			251	848.8	27.76	26.07

8.1.2. GSM 1900

Test Engineer ID:	38602	Test Date:	9/10/2021

Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Conducted Average Power (dBm)	
					ANT 1	ANT 2
GPRS (GMSK)	CS1	1	512	1850.2	30.26	**28.00**
			661	1880	**30.50**	27.41
			810	1909.8	30.21	27.54
		2	512	1850.2	29.24	26.66
			661	1880	29.50	26.49
			810	1909.8	29.23	26.17
EGPRS (8PSK)	MCS5	1	512	1850.2	26.79	**23.07**
			661	1880	**26.90**	22.76
			810	1909.8	26.75	22.03
		2	512	1850.2	26.72	21.93
			661	1880	26.73	21.57
			810	1909.8	26.56	20.91

WCDMA

TEST PROCEDURE

The transmitter output was connected to the input terminal of Directional Coupler via calibrated coaxial cable. The output coupling terminal of the Directional Coupler was directly connected to a spectrum analyzer while the output through terminal connected to the communication test set via calibrated coaxial cable.

The output power was measured with the spectrum analyzer at the low, middle and high channel in each band.

- Set the spectrum analyzer span wide enough or greater than the modulated signal BW.
- Set a spectrum analyzer at peak detection mode with VBW ≥ RBW.≥ 26dB BW, typically 5MHz.
- Set a marker to point the corresponding peak value.

REL 99

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc/βd	8/15

HSDPA REL 5

The following 4 Sub-tests were completed according to Release 5 procedures in table C.10.1.4 of 3GPP TS 34.121-1 A summary of these settings are illustrated below:

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

HSPA REL 6 (HSDPA & HSUPA)

The following 5 Sub-tests were completed according to Release 6 procedures in table C.11.1.3 of 3GPP TS 34.121-1. A summary of these settings are illustrated below:

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
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
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c.

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

DUAL CARRIER HSDPA (DC-HSDPA (REL 8, CAT 24)

The following 4 Sub-tests for DC-HSDPA were completed according to Release 8 procedures in table C08.1.12 of 3GPP TS 34.121-1. A summary of subtest settings are illustrated below:

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK

Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.

Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.

HSPA+ REL 7

The following 1 Sub-test was completed according to Release 7 procedures in table C.11.1.4 of 3GPP TS34.121. A summary of these settings are illustrated below:

Table C.11.1.4: **β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM**

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	$\beta_{ed}1$: 30/15 $\beta_{ed}2$: 30/15	$\beta_{ed}3$: 24/15 $\beta_{ed}4$: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signalled to use the extrapolation algorithm.

RESULT

8.1.3. WCDMA BAND 5

Test Engineer ID:	19467	Test Date:	9/17/2021

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)	
						ANT 1	ANT 2
W-CDMA Band 5 (850MHz)	Rel 99	RMC, 12.2 kbps	4132	826.4	N/A	**25.70**	24.17
			4183	836.6	N/A	25.67	24.19
			4233	846.6	N/A	25.66	**24.20**
	HSDPA	Subtest 1	4132	826.4	0	24.68	23.19
			4183	836.6	0	24.62	23.22
			4233	846.6	0	24.67	23.24
		Subtest 2	4132	826.4	0	24.77	23.20
			4183	836.6	0	24.67	23.24
			4233	846.6	0	24.70	23.25
		Subtest 3	4132	826.4	0.5	24.24	22.73
			4183	836.6	0.5	24.19	22.74
			4233	846.6	0.5	24.19	22.74
		Subtest 4	4132	826.4	0.5	24.23	22.73
			4183	836.6	0.5	24.18	22.73
			4233	846.6	0.5	24.20	22.73
	HSPA (HSDPA & HSUPA)	Subtest 1	4132	826.4	0	24.75	23.25
			4183	836.6	0	24.71	23.26
			4233	846.6	0	24.75	**23.31**
		Subtest 2	4132	826.4	2	22.76	21.22
			4183	836.6	2	22.70	21.28
			4233	846.6	2	22.73	21.30
		Subtest 3	4132	826.4	1	23.74	22.20
			4183	836.6	1	23.69	22.27
			4233	846.6	1	23.74	22.28
		Subtest 4	4132	826.4	2	22.76	21.23
			4183	836.6	2	22.68	21.27
			4233	846.6	2	22.73	21.32
		Subtest 5	4132	826.4	0	24.28	22.78
			4183	836.6	0	24.23	22.82
			4233	846.6	0	24.28	22.86
	DC-HSDPA	Subtest 1	4132	826.4	0	24.76	23.13
			4183	836.6	0	24.69	23.16
			4233	846.6	0	24.75	23.18
		Subtest 2	4132	826.4	0	**24.79**	23.12
			4183	836.6	0	24.73	23.15
			4233	846.6	0	24.24	23.16
		Subtest 3	4132	826.4	0.5	24.27	22.64
			4183	836.6	0.5	24.22	22.66
			4233	846.6	0.5	24.22	22.65
		Subtest 4	4132	826.4	0.5	24.31	22.64
			4183	836.6	0.5	24.23	22.65
			4233	846.6	0.5	24.21	22.68

8.1.4. WCDMA BAND 2

Test Engineer ID:	19467	Test Date:	9/16/2021

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)	
						ANT 1	ANT 2
W-CDMA Band 2 (1900MHz)	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	**25.70**	**22.40**
			9400	1880.0	N/A	25.65	22.34
			9538	1907.6	N/A	25.53	21.99
	HSDPA	Subtest 1	9262	1852.4	0	24.71	**21.51**
			9400	1880.0	0	24.64	21.36
			9538	1907.6	0	24.57	21.02
		Subtest 2	9262	1852.4	0	**24.73**	21.44
			9400	1880.0	0	24.65	21.35
			9538	1907.6	0	24.57	21.01
		Subtest 3	9262	1852.4	0.5	24.21	20.95
			9400	1880.0	0.5	24.14	20.88
			9538	1907.6	0.5	24.06	20.53
		Subtest 4	9262	1852.4	0.5	24.26	21.02
			9400	1880.0	0.5	24.11	20.86
			9538	1907.6	0.5	24.05	20.54
	HSPA (HSDPA & HSUPA)	Subtest 1	9262	1852.4	0	24.71	21.50
			9400	1880.0	0	24.68	21.40
			9538	1907.6	0	24.59	21.12
		Subtest 2	9262	1852.4	2	22.70	19.51
			9400	1880.0	2	22.66	19.44
			9538	1907.6	2	22.53	19.11
		Subtest 3	9262	1852.4	1	23.75	20.42
			9400	1880.0	1	23.63	20.42
			9538	1907.6	1	23.55	20.08
		Subtest 4	9262	1852.4	2	22.76	19.55
			9400	1880.0	2	22.67	19.47
			9538	1907.6	2	22.60	19.11
		Subtest 5	9262	1852.4	0	24.29	21.05
			9400	1880.0	0	24.24	20.98
			9538	1907.6	0	24.14	20.67
	DC-HSDPA	Subtest 1	9262	1852.4	0	24.46	21.33
			9400	1880.0	0	23.72	21.26
			9538	1907.6	0	23.62	20.93
		Subtest 2	9262	1852.4	0	23.74	21.30
			9400	1880.0	0	23.72	21.23
			9538	1907.6	0	23.63	20.91
		Subtest 3	9262	1852.4	0.5	23.26	20.85
			9400	1880.0	0.5	23.24	20.75
			9538	1907.6	0.5	23.13	20.44
		Subtest 4	9262	1852.4	0.5	23.28	20.84
			9400	1880.0	0.5	23.24	20.75
			9538	1907.6	0.5	23.13	20.44

8.1.5. WCDMA BAND 4

Test Engineer ID:	19467	Test Date:	9/16/2021

Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)	
						ANT 1	ANT 2
W-CDMA Band 4 (1700MHz)	Rel 99	RMC, 12.2 kbps	1312	1712.4	N/A	**25.70**	**22.40**
			1413	1732.6	N/A	25.69	22.19
			1513	1752.6	N/A	25.57	22.34
	HSDPA	Subtest 1	1312	1712.4	0	24.71	**21.53**
			1413	1732.6	0	24.67	21.20
			1513	1752.6	0	24.55	21.35
		Subtest 2	1312	1712.4	0	24.67	21.49
			1413	1732.6	0	24.65	21.17
			1513	1752.6	0	24.57	21.38
		Subtest 3	1312	1712.4	0.5	24.17	20.95
			1413	1732.6	0.5	24.16	20.73
			1513	1752.6	0.5	24.09	20.88
		Subtest 4	1312	1712.4	0.5	24.23	20.96
			1413	1732.6	0.5	24.17	20.71
			1513	1752.6	0.5	24.09	20.89
	HSPA (HSDPA & HSUPA)	Subtest 1	1312	1712.4	0	24.72	21.52
			1413	1732.6	0	24.69	21.30
			1513	1752.6	0	24.61	21.48
		Subtest 2	1312	1712.4	2	22.74	19.49
			1413	1732.6	2	22.72	19.29
			1513	1752.6	2	22.61	19.44
		Subtest 3	1312	1712.4	1	23.70	20.47
			1413	1732.6	1	23.73	20.30
			1513	1752.6	1	23.62	20.44
		Subtest 4	1312	1712.4	2	22.68	19.54
			1413	1732.6	2	22.72	19.28
			1513	1752.6	2	22.64	19.50
		Subtest 5	1312	1712.4	0	24.26	21.04
			1413	1732.6	0	24.25	20.81
			1513	1752.6	0	24.17	20.98
	DC-HSDPA	Subtest 1	1312	1712.4	0	24.77	21.47
			1413	1732.6	0	24.77	21.22
			1513	1752.6	0	24.66	21.35
		Subtest 2	1312	1712.4	0	**24.82**	21.45
			1413	1732.6	0	24.76	21.20
			1513	1752.6	0	24.67	21.36
		Subtest 3	1312	1712.4	0.5	24.30	20.96
			1413	1732.6	0.5	24.25	20.70
			1513	1752.6	0.5	24.19	20.88
		Subtest 4	1312	1712.4	0.5	24.28	20.99
			1413	1732.6	0.5	24.26	20.73
			1513	1752.6	0.5	24.17	20.89

9. CONDUCTED TEST RESULTS

9.1. OCCUPIED BANDWIDTH

RULE PART(S)

FCC: §2.1049
ISED: RSS132; RSS133§2.3; RSS139

LIMITS

For reporting purposes only.

TEST PROCEDURE

The transmitter output was connected to a calibrated coaxial cable and coupler, the other end of which was connected to a spectrum analyzer. The occupied bandwidth was measured with the spectrum analyzer at the middle channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

RESULTS

There is no limit required and power is the same for low, middle and high channel; therefore, only middle channel was tested.

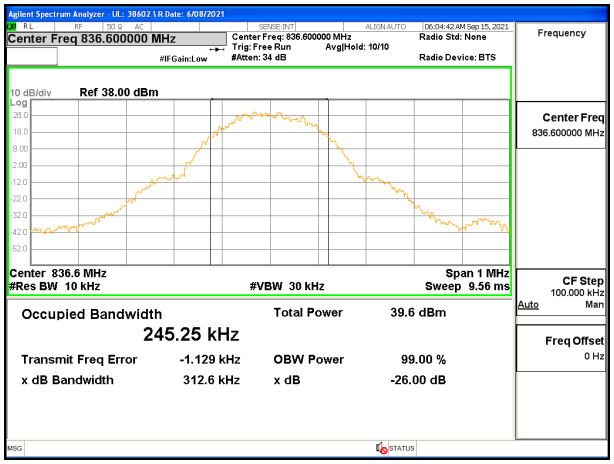
GSM

Band	Modulation	Channel	f(MHz)	99% BW (KHz)	-26dB BW (KHz)
850	GPRS	190	836.6	245.25	312.6
	EGPRS			242.18	316.4
1900	GPRS	661	1880.0	249.11	315.5
	EGPRS			243.03	311.0

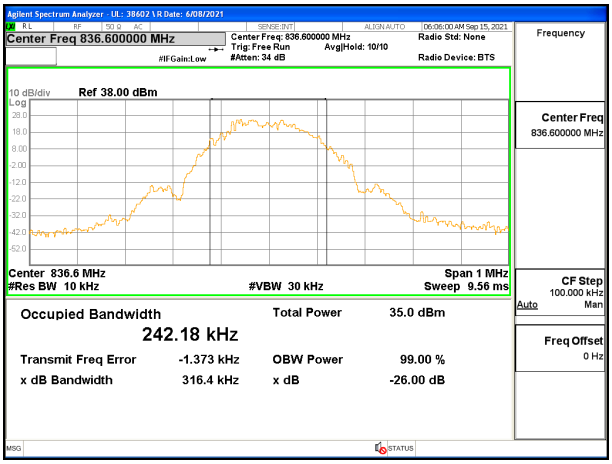
WCDMA

Band	Modulation	Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
BAND 5	REL 99	4408	836.6	4.1534	4.710
	HSDPA			4.1522	4.682
BAND 2	REL 99	9800	1880.0	4.1511	4.719
	HSDPA			4.1596	4.715
BAND 4	REL 99	1638	1732.6	4.1386	4.704
	HSDPA			4.1611	4.708

9.1.1. GSM 850

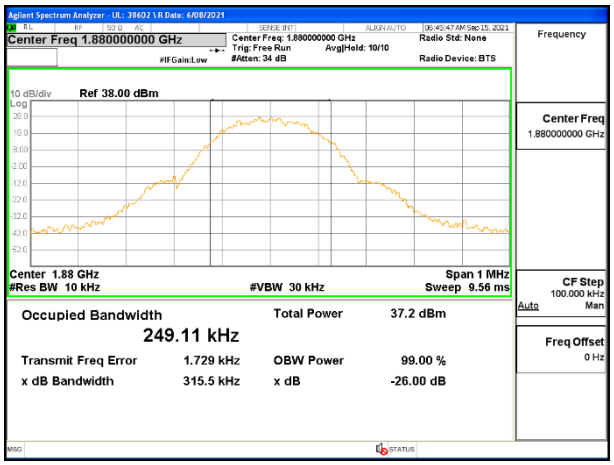


GSM 850 GPRS Middle Channel

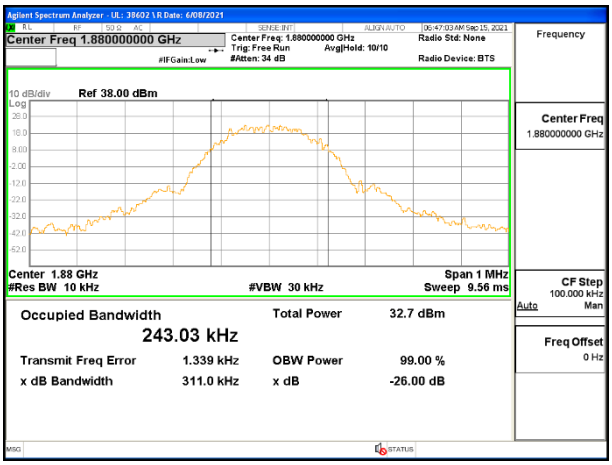


GSM 850 EGPRS Middle Channel

9.1.2. GSM 1900

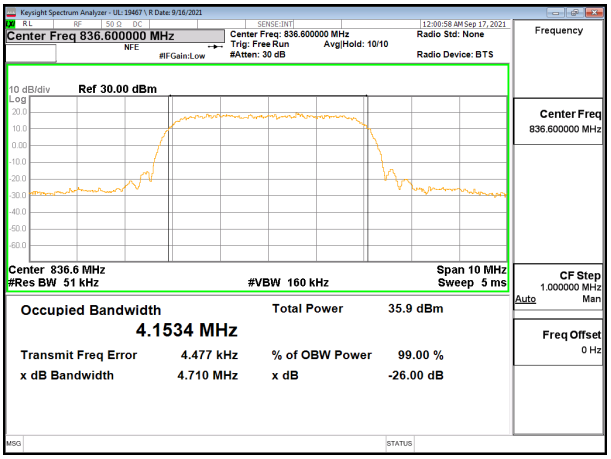


GSM 1900 GPRS Middle Channel

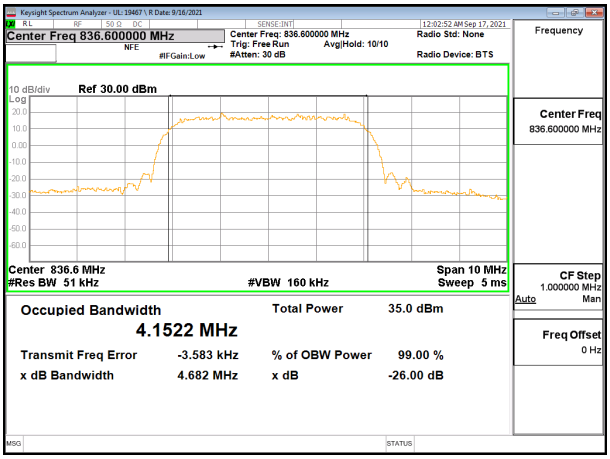


GSM 1900 EGPRS Middle Channel

9.1.3. WCDMA BAND 5

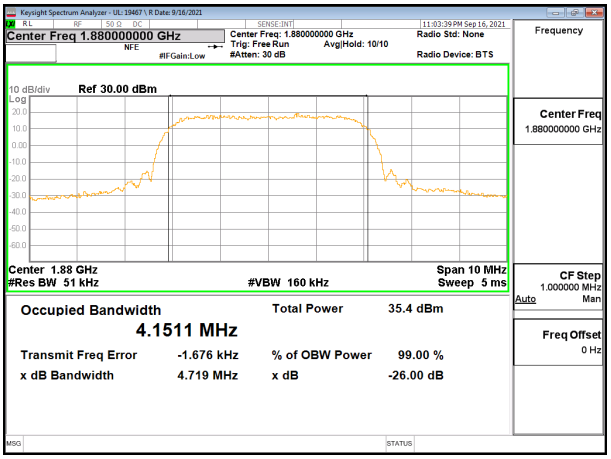


WCDMA Band 5 Rel 99 Middle Channel

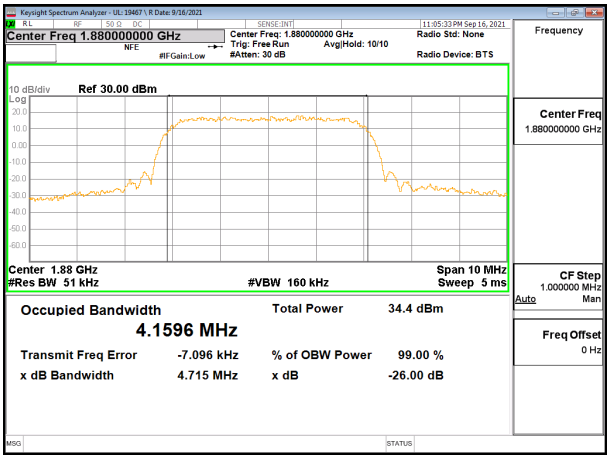


WCDMA Band 5 HSDPA Middle Channel

9.1.4. WCDMA BAND 2

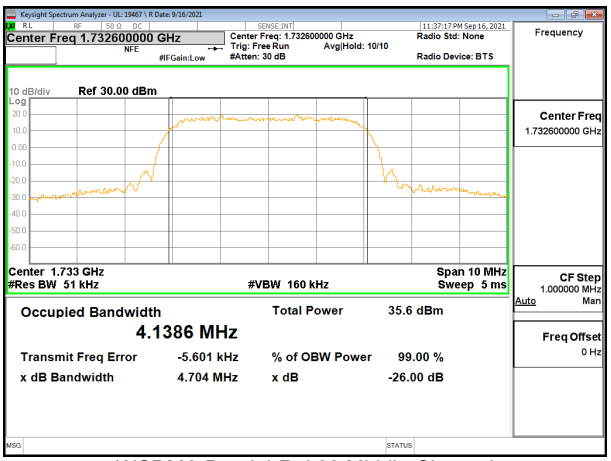


WCDMA Band 2 Rel 99 Middle Channel

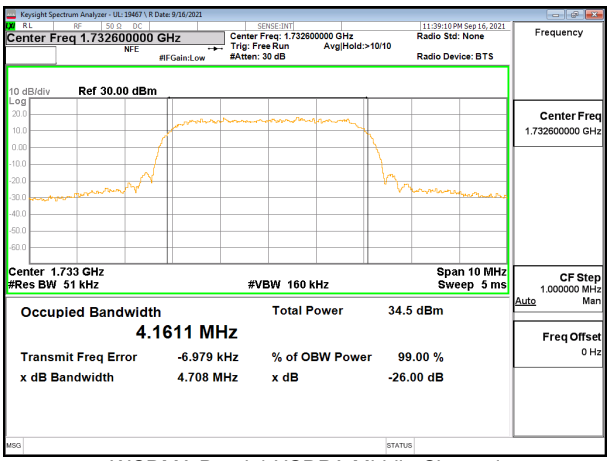


WCDMA Band 2 HSDPA Middle Channel

9.1.5. WCDMA BAND 4



WCDMA Band 4 Rel 99 Middle Channel



WCDMA Band 4 HSDPA Middle Channel

9.2. BAND EDGE AND EMISSION MASK

LIMITS

FCC: §22.917(a), §24.238, §27.53 (h)
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

(1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log10(f/6.1) decibels or 50 + 10 Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.

(2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

RSS132§5.5
Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p (watts).
(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least43 + 10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

RSS133§6.5.1
Equipment shall comply with the limits in (i) and (ii) below.

(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment’s operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts).
(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

RSS139§6.6

(i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment’s smallest operating frequency block,Footnote2 which can contain the equipment’s occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least43 + 10 log10 p (watts) dB.
(ii) After the first 1.0 MHz outside the equipment’s smallest operating frequency block, which can contain the equipment’s occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.

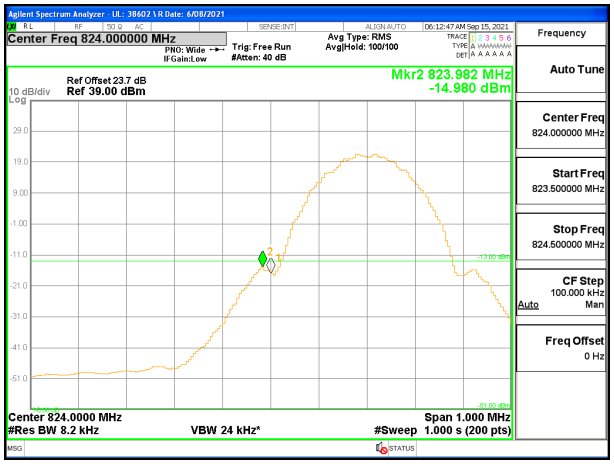
TEST PROCEDURE

The transmitter output was connected to a R&S CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer. For each band edge measurement:

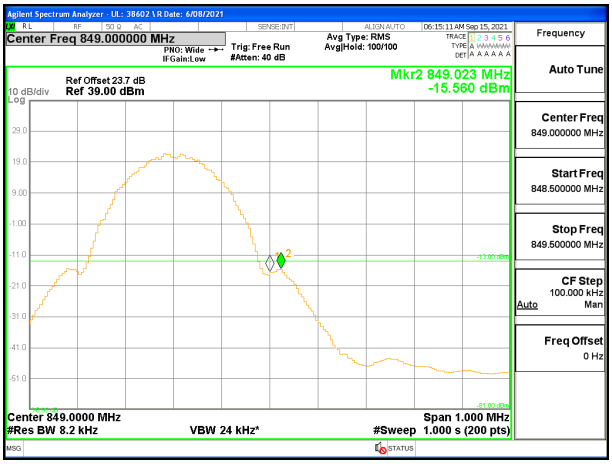
- Set the spectrum analyzer span to include the block edge frequency.
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

RESULTS

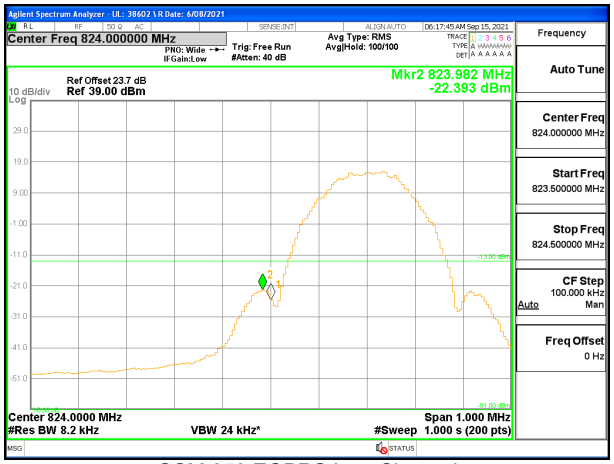
9.2.1. GSM 850



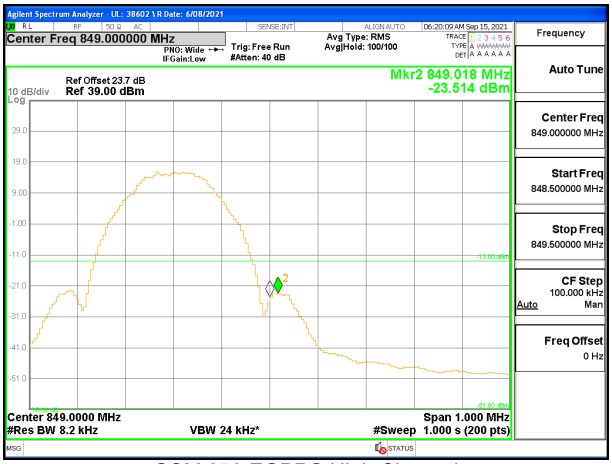
GSM 850 GPRS Low Channel



GSM 850 GPRS High Channel

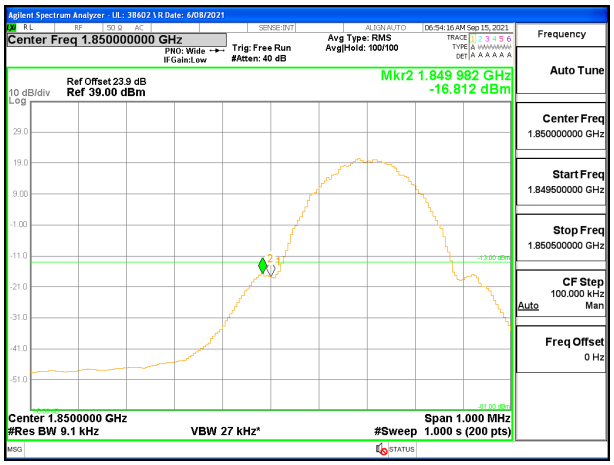


GSM 850 EGPRS Low Channel

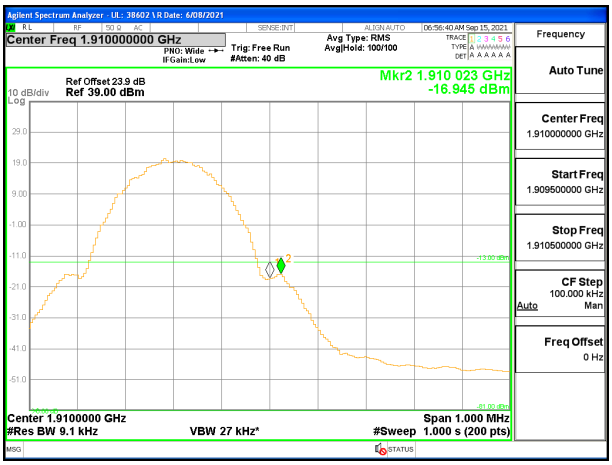


GSM 850 EGPRS High Channel

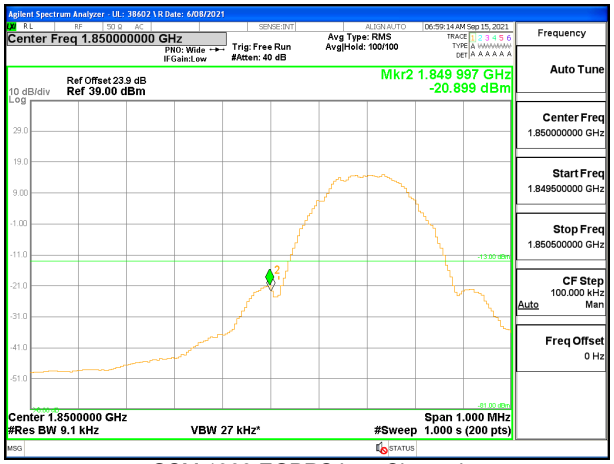
9.2.2. GSM 1900



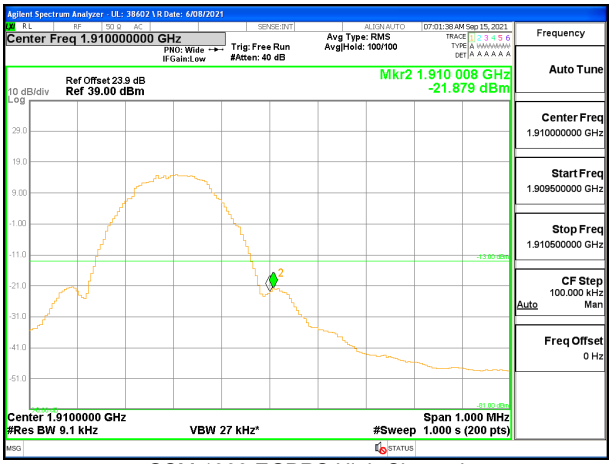
GSM 1900 GPRS Low Channel



GSM 1900 GPRS High Channel

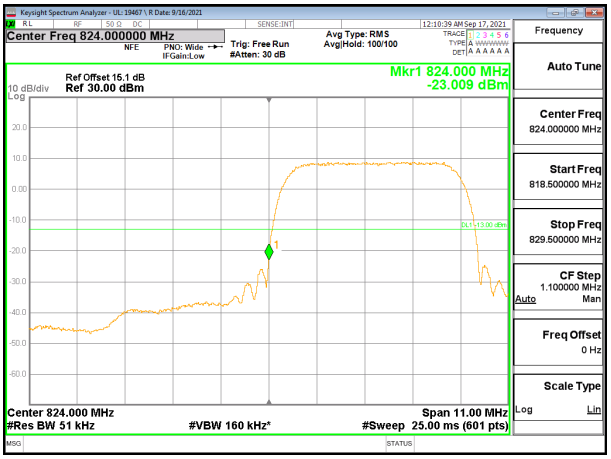


GSM 1900 EGPRS Low Channel

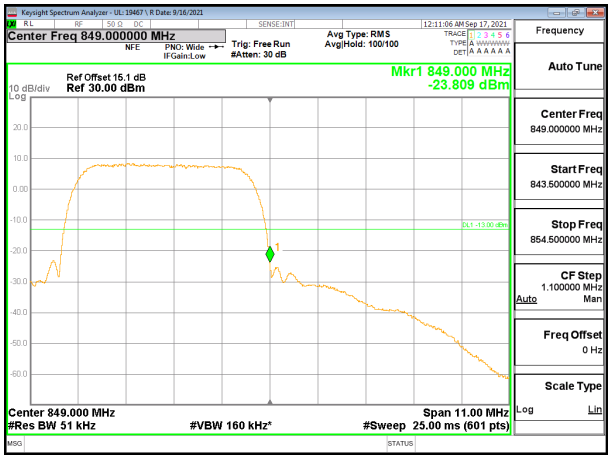


GSM 1900 EGPRS High Channel

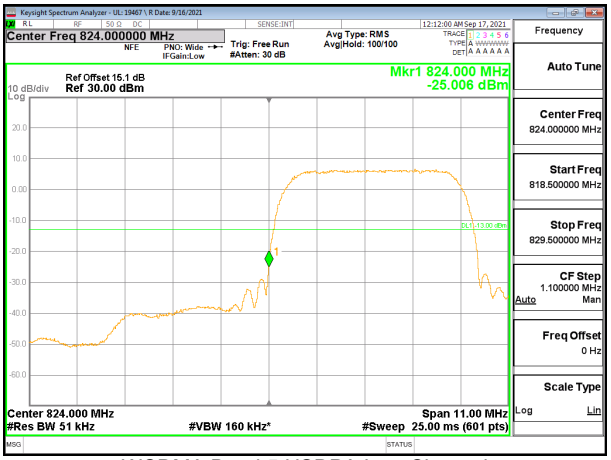
9.2.3. WCDMA BAND 5



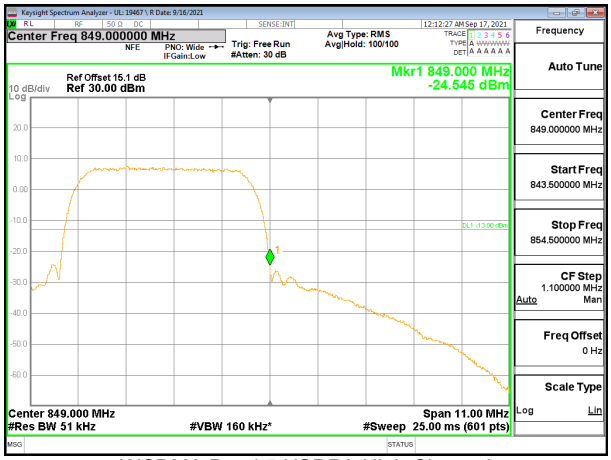
WCDMA Band 5 Rel 99 Low Channel



WCDMA Band 5 Rel 99 High Channel

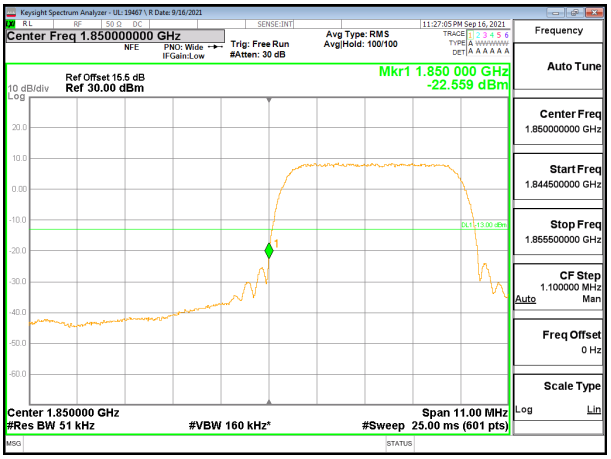


WCDMA Band 5 HSDPA Low Channel

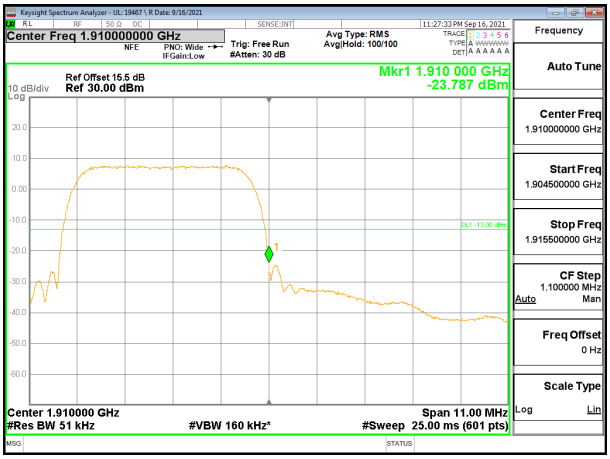


WCDMA Band 5 HSDPA High Channel

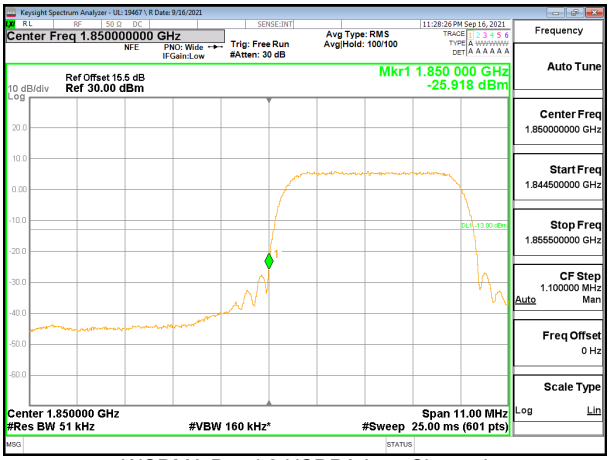
9.2.4. WCDMA BAND 2



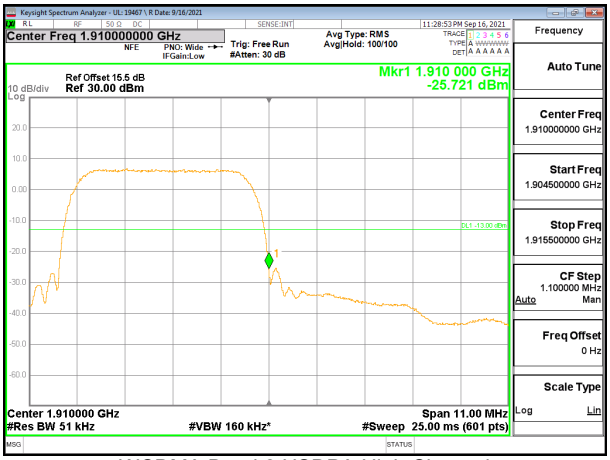
WCDMA Band 2 Rel 99 Low Channel



WCDMA Band 2 Rel 99 High Channel

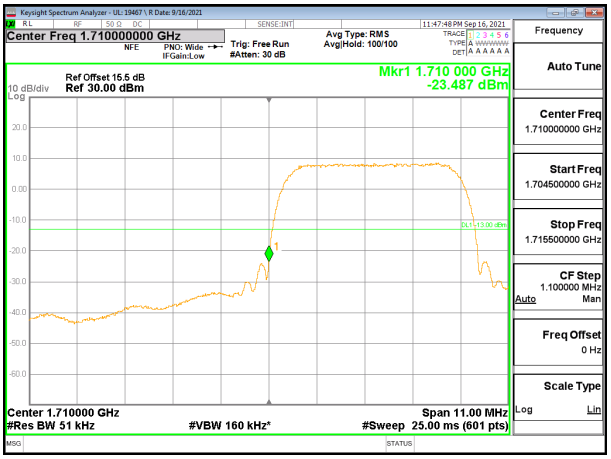


WCDMA Band 2 HSDPA Low Channel

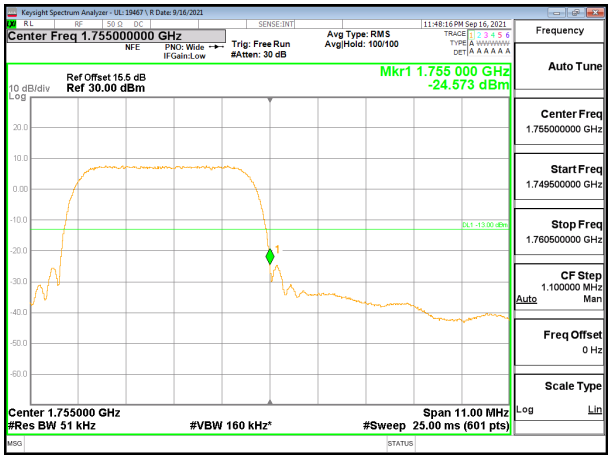


WCDMA Band 2 HSDPA High Channel

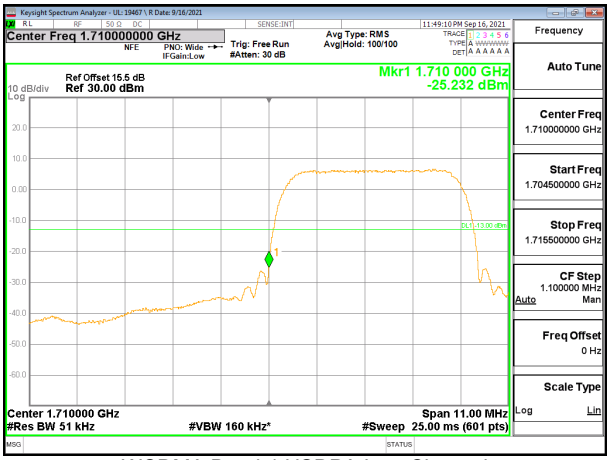
9.2.5. WCDMA BAND 4



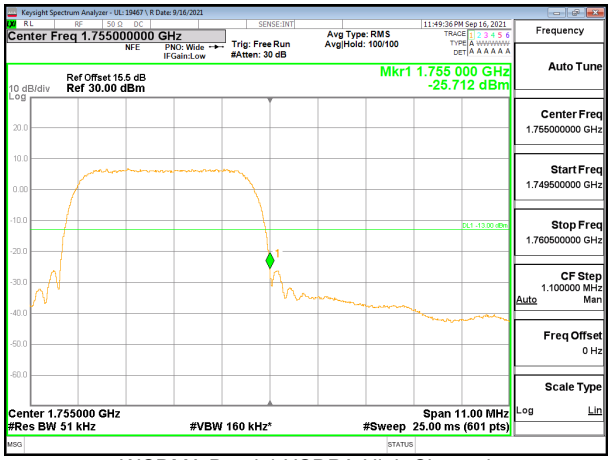
WCDMA Band 4 Rel 99 Low Channel



WCDMA Band 4 Rel 99 High Channel



WCDMA Band 4 HSDPA Low Channel



WCDMA Band 4 HSDPA High Channel

9.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, §22.917, §24.238, and §27.53
ISED: RSS132§5.5; RSS133§6.5 and RSS139§6.6

LIMITS

FCC: §22.917(a), §24.238, §27.53 (h)
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.

RSS132§5.5, RSS133§6.5.1, RSS139§6.6
The minimum permissible attenuation level of any spurious emissions is 43 + 10 log (P) dB where transmitting power (P) in Watts.

TEST PROCEDURE

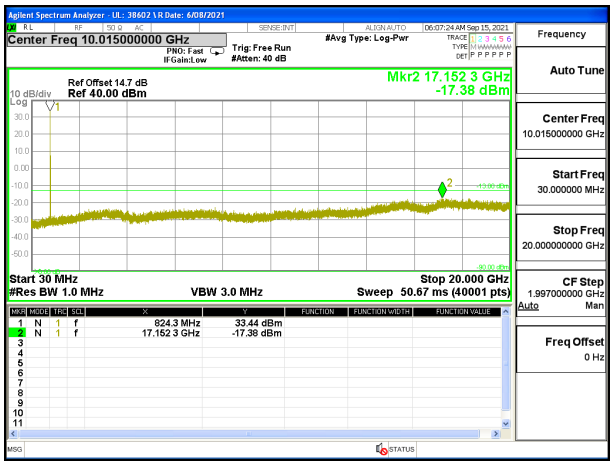
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case emissions were caught.

For each out of band emissions measurement:

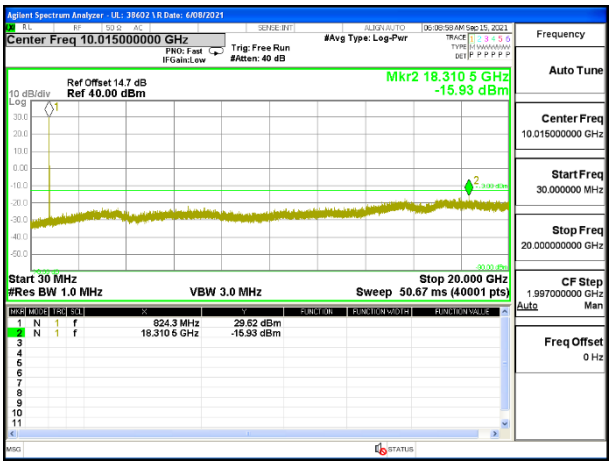
- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz. (NOTE: Worst case set RBW/VBW to 1MHz/3MHz)

RESULTS

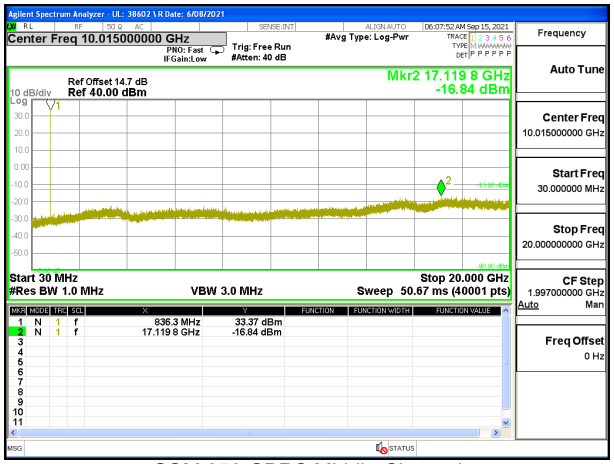
9.3.1. GSM 850



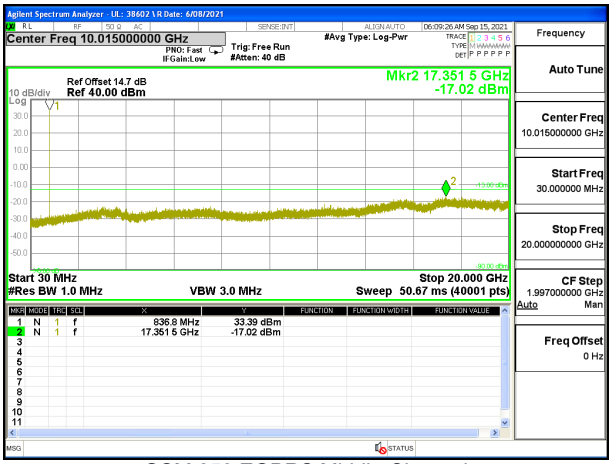
GSM 850 GPRS Low Channel



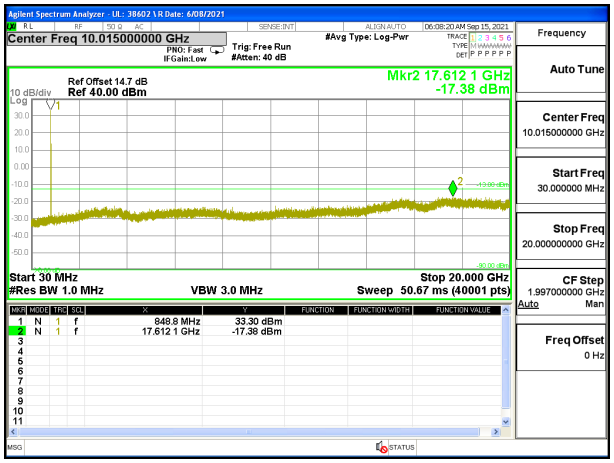
GSM 850 EGPRS Low Channel



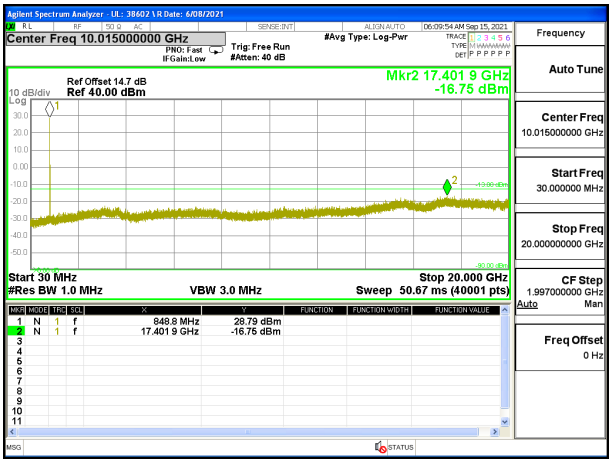
GSM 850 GPRS Middle Channel



GSM 850 EGPRS Middle Channel

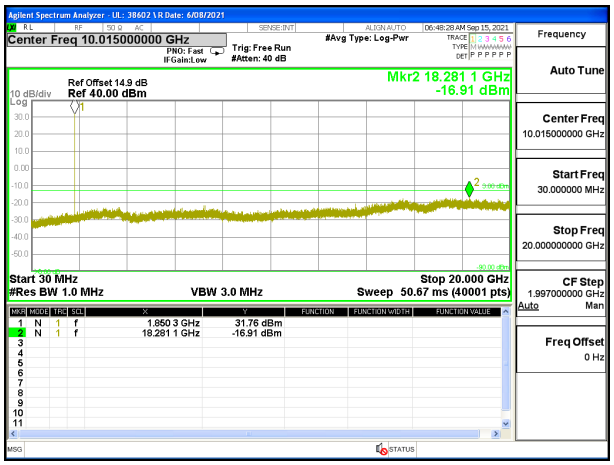


GSM 850 GPRS High Channel

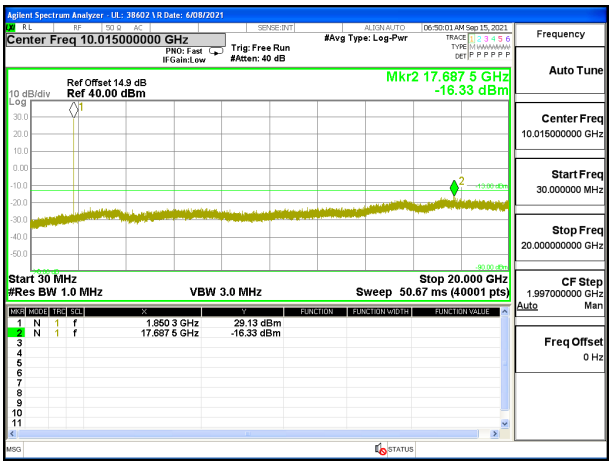


GSM 850 EGPRS High Channel

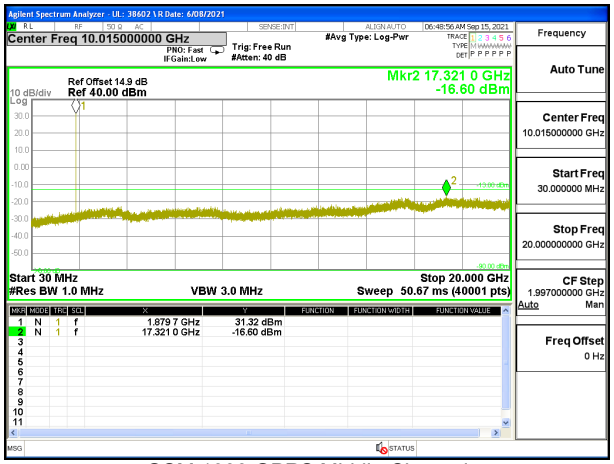
9.3.2. GSM 1900



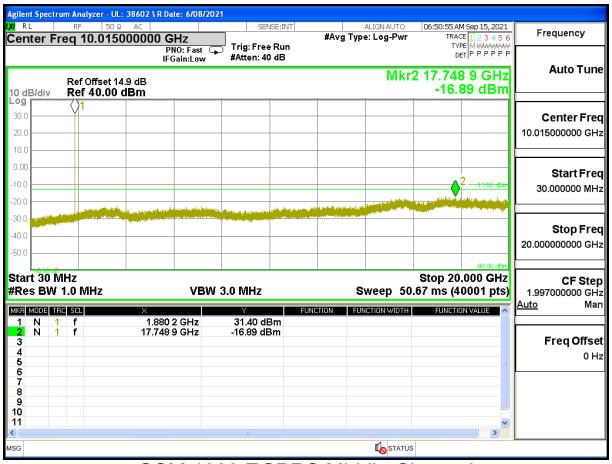
GSM 1900 GPRS Low Channel



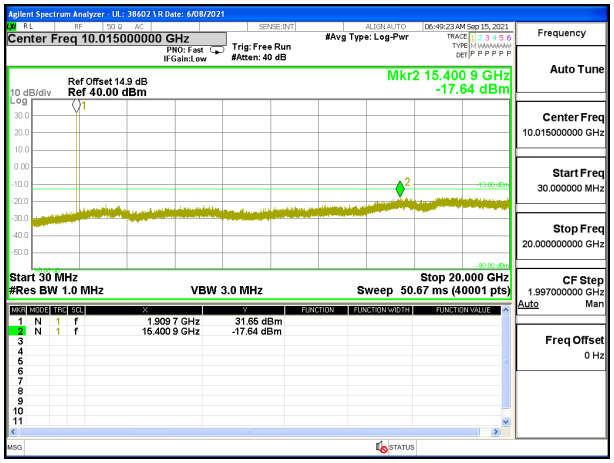
GSM 1900 EGPRS Low Channel



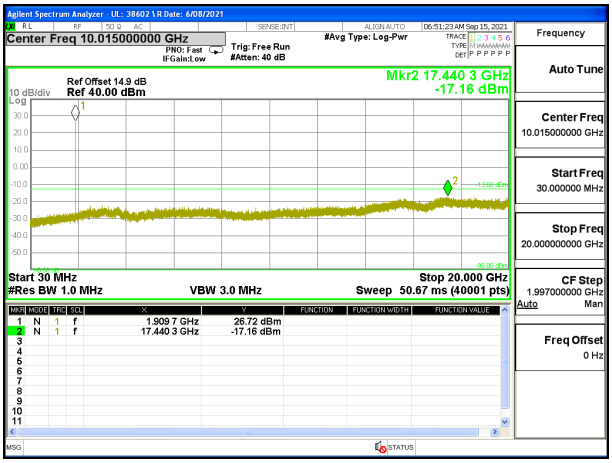
GSM 1900 GPRS Middle Channel



GSM 1900 EGPRS Middle Channel

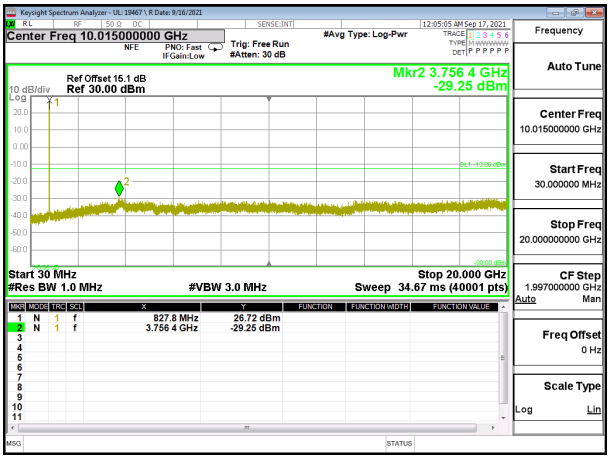


GSM 1900 GPRS High Channel

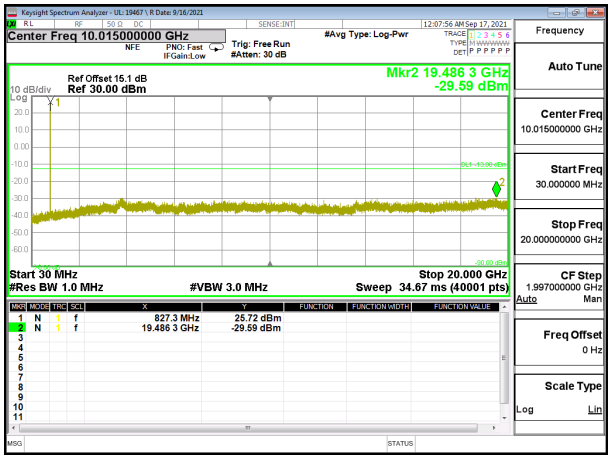


GSM 1900 EGPRS High Channel

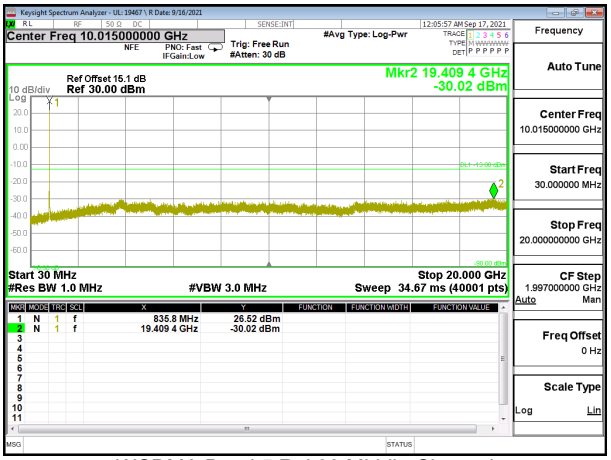
9.3.3. WCDMA BAND 5



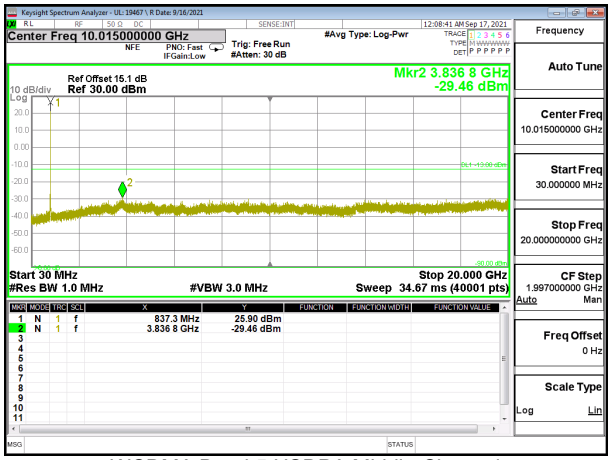
WCDMA Band 5 Rel 99 Low Channel



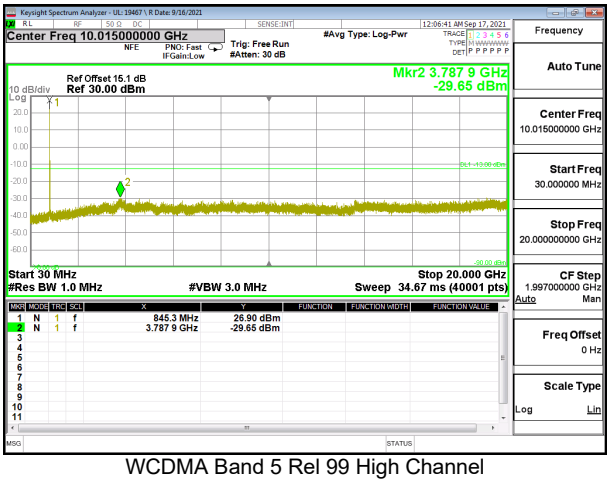
WCDMA Band 5 HSDPA Low Channel



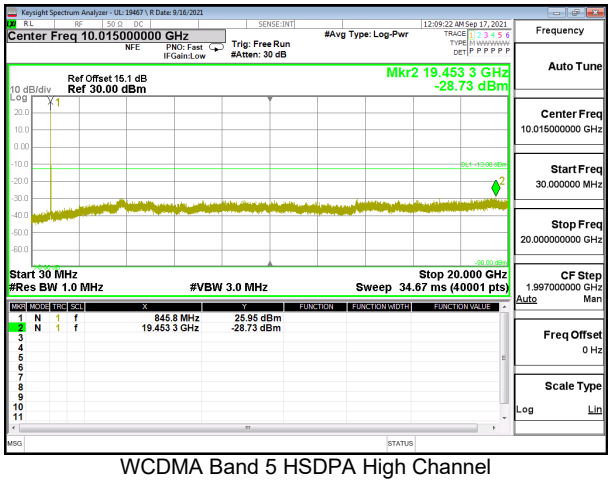
WCDMA Band 5 Rel 99 Middle Channel



WCDMA Band 5 HSDPA Middle Channel

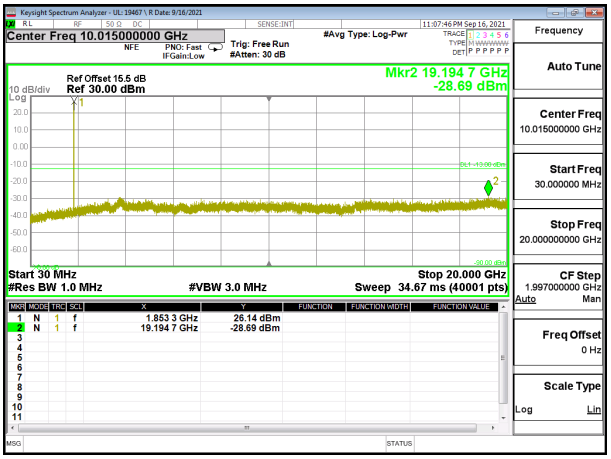


WCDMA Band 5 Rel 99 High Channel

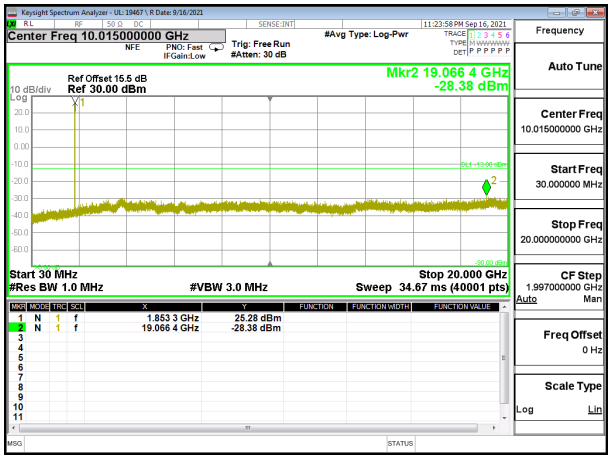


WCDMA Band 5 HSDPA High Channel

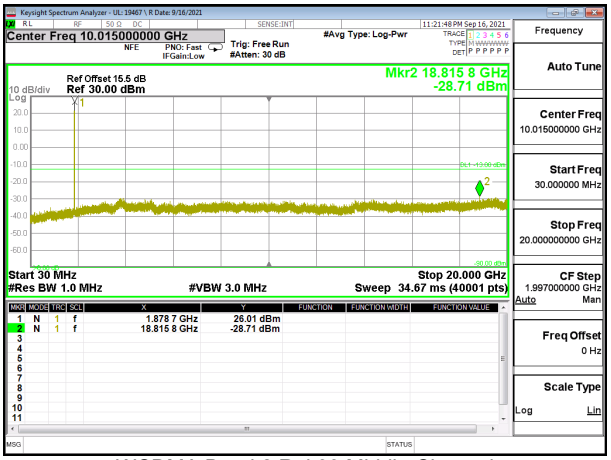
9.3.4. WCDMA BAND 2



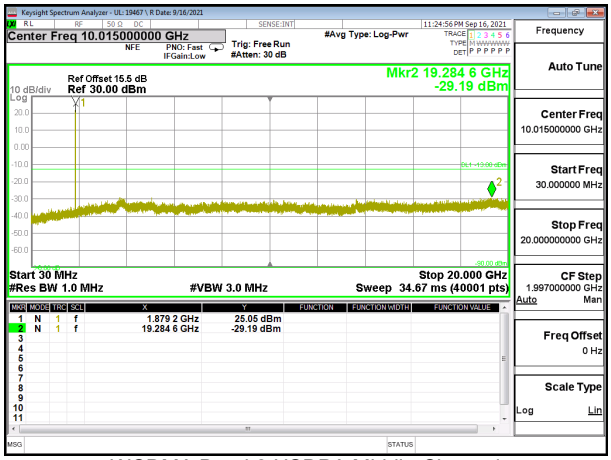
WCDMA Band 2 Rel 99 Low Channel



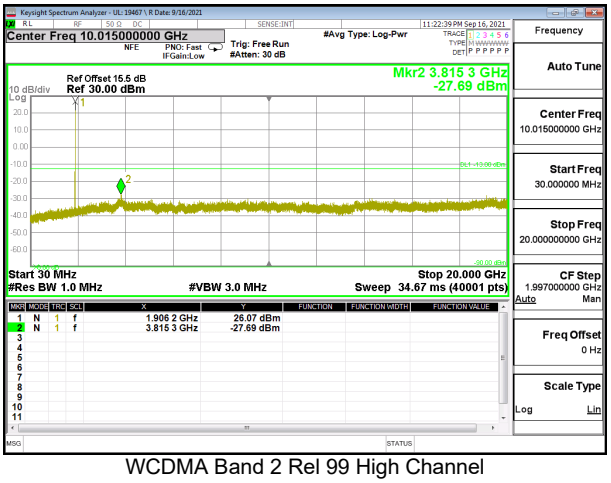
WCDMA Band 2 HSDPA Low Channel



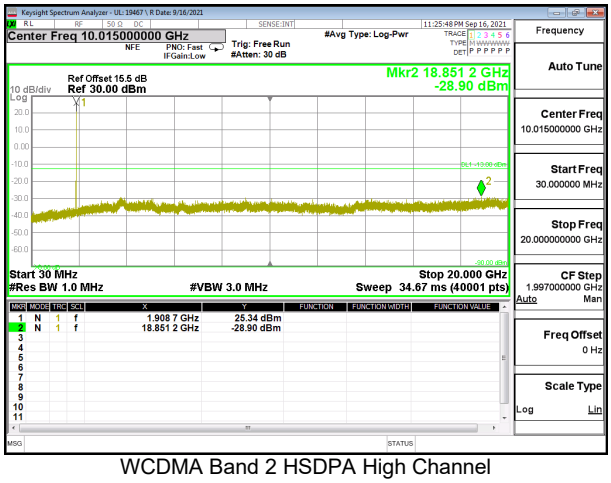
WCDMA Band 2 Rel 99 Middle Channel



WCDMA Band 2 HSDPA Middle Channel

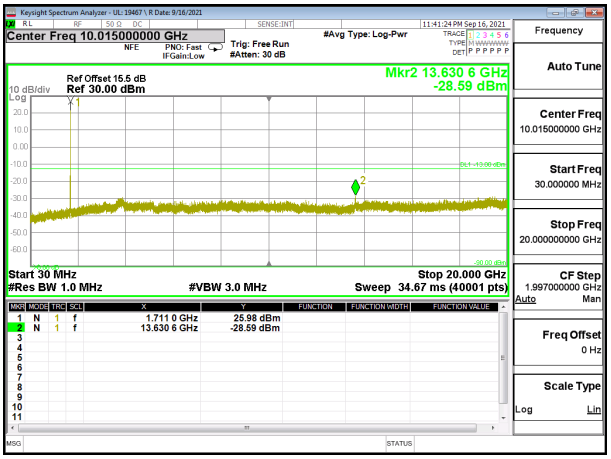


WCDMA Band 2 Rel 99 High Channel

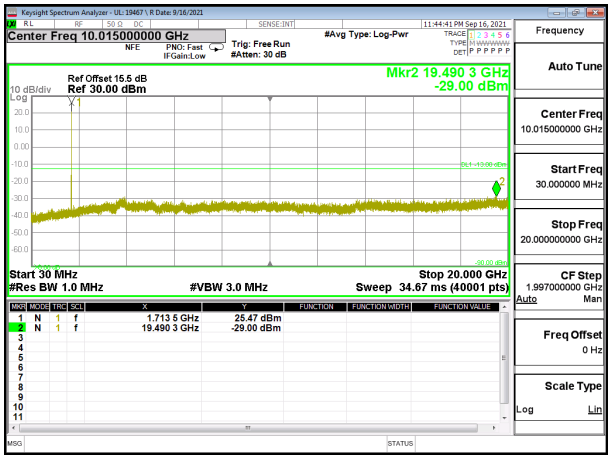


WCDMA Band 2 HSDPA High Channel

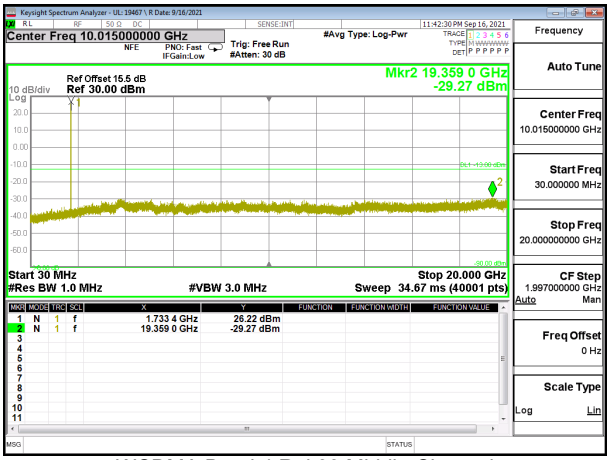
9.3.5. WCDMA BAND 4



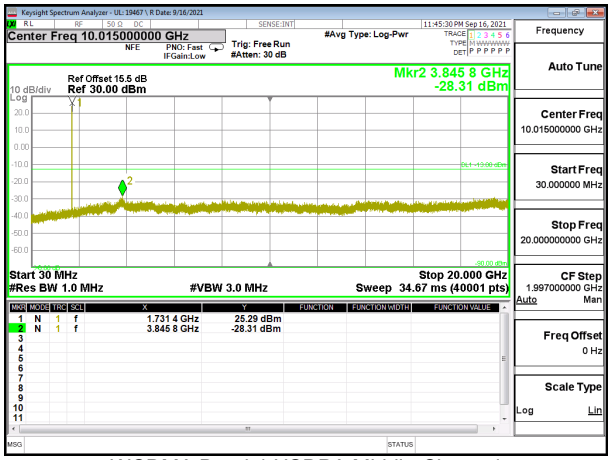
WCDMA Band 4 Rel 99 Low Channel



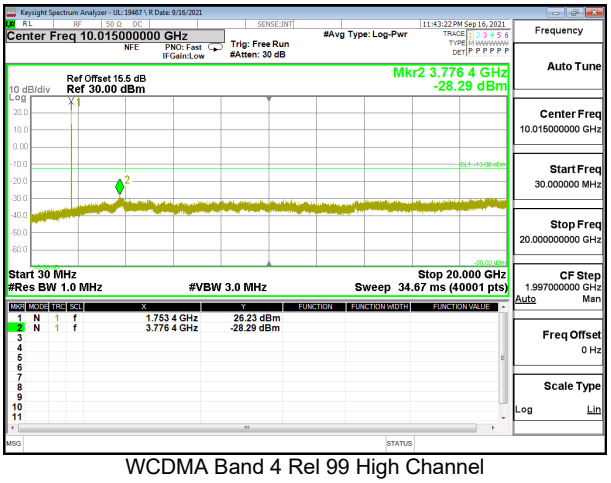
WCDMA Band 4 HSDPA Low Channel



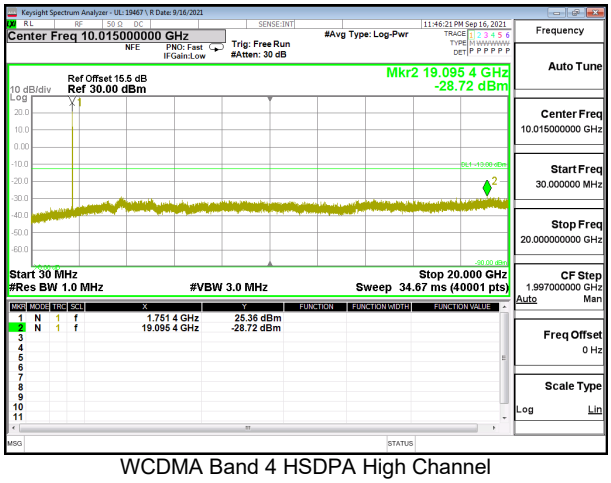
WCDMA Band 4 Rel 99 Middle Channel



WCDMA Band 4 HSDPA Middle Channel



WCDMA Band 4 Rel 99 High Channel



WCDMA Band 4 HSDPA High Channel

9.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355, §24.235, and §27.54
ISED: RSS132§5.3; RSS133§6.3 and RSS139§6.4

LIMITS

FCC §24.235 & §27.54
The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

RSS132§5.3
The carrier frequency shall not depart from the reference frequency in excess of ±2.5 SRSP for mobile stations and±1.5 ppm for base stations.
In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the occupied bandwidth stays within each of the sub-bands (see Section 5.1) when tested to the temperature and supply voltage variations specified in RSS-Gen.

RSS133§6.3
The carrier frequency shall not depart from the reference frequency, in excess of ±2.5 ppm for mobile stations and±1.0 ppm for base stations.
In lieu of meeting the above stability values, the test report may show that the frequency stability is sufficient to ensure that the emission bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

RSS139§6.4
The frequency stability shall be sufficient to ensure that the occupied bandwidth stays within the operating frequency block when tested to the temperature and supply voltage variations specified in RSS-Gen.

TEST PROCEDURE

Use CMW 500 with Frequency Error measurement capability.

- Temp. = −30°C to +50°C
- Voltage = (85% - 115%)

  Low voltage, 3.23VDC, Normal, 3.80VDC and High voltage, 4.37VDC.
  End Voltage, 3.00VDC.

Frequency Stability vs Temperature:
The EUT is place inside a temperature chamber. The temperature is set to 20ºC and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until +50ºC is reached.

Frequency Stability vs Voltage:
The peak frequency error is recorded (worst-case).

RESULTS

See the following pages.

Test Engineer ID:	25602	Test Date:	11/4/2021

9.4.1. GPRS 850

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	824.0640	848.9350		
Extreme (50C)		824.0640	848.9350	22.2	0.027
Extreme (40C)		824.0640	848.9350	20.3	0.024
Extreme (30C)		824.0640	848.9350	20.6	0.025
Extreme (10C)		824.0640	848.9350	21.5	0.026
Extreme (0C)		824.0640	848.9350	21.3	0.025
Extreme (-10C)		824.0640	848.9350	34.1	0.041
Extreme (-20C)		824.0640	848.9350	24.9	0.030
Extreme (-30C)		824.0640	848.9350	25.5	0.030
20C	15%	824.0640	848.9350	15.1	0.018
	-15%	824.0640	848.9350	15.7	0.019
	End Point	824.0640	848.9350	17.3	0.021

9.4.2. GPRS 1900

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1850.0760	1909.9210		
Extreme (50C)		1850.0760	1909.9210	26.1	0.014
Extreme (40C)		1850.0760	1909.9210	25.4	0.014
Extreme (30C)		1850.0760	1909.9210	21.7	0.012
Extreme (10C)		1850.0760	1909.9210	25.3	0.013
Extreme (0C)		1850.0760	1909.9210	16.0	0.009
Extreme (-10C)		1850.0760	1909.9210	25.4	0.014
Extreme (-20C)		1850.0760	1909.9210	21.1	0.011
Extreme (-30C)		1850.0760	1909.9210	29.5	0.016
20C	15%	1850.0760	1909.9210	22.9	0.012
	-15%	1850.0760	1909.9210	22.1	0.012
	End Point	1850.0760	1909.9210	23.3	0.012

Test Engineer ID:	38602	Test Date:	11/2/2021

9.4.3. WCDMA BAND 5

Limit		824	849	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)		824.1577	848.8698		
Extreme (50C)		824.1577	848.8698	1.7	0.002
Extreme (40C)		824.1577	848.8698	1.6	0.002
Extreme (30C)		824.1577	848.8698	1.8	0.002
Extreme (10C)	Normal	824.1577	848.8698	2.2	0.003
Extreme (0C)		824.1577	848.8698	2.4	0.003
Extreme (-10C)		824.1577	848.8698	2.5	0.003
Extreme (-20C)		824.1577	848.8698	2.3	0.003
Extreme (-30C)		824.1577	848.8698	2.2	0.003
20C	15%	824.1577	848.8698	1.7	0.002
	-15%	824.1577	848.8698	2.1	0.003
	End Point	824.1577	848.8698	1.8	0.002

9.4.4. WCDMA BAND 2

Limit		1850	1910	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)		1850.1345	1909.9022		
Extreme (50C)		1850.1345	1909.9022	4.8	0.003
Extreme (40C)		1850.1345	1909.9022	4.7	0.003
Extreme (30C)		1850.1345	1909.9022	5.2	0.003
Extreme (10C)	Normal	1850.1345	1909.9022	6.0	0.003
Extreme (0C)		1850.1345	1909.9022	6.5	0.003
Extreme (-10C)		1850.1345	1909.9022	6.9	0.004
Extreme (-20C)		1850.1345	1909.9022	7.2	0.004
Extreme (-30C)		1850.1345	1909.9022	6.6	0.004
20C	15%	1850.1345	1909.9022	5.1	0.003
	-15%	1850.1345	1909.9022	5.7	0.003
	End Point	1850.1345	1909.9022	6.2	0.003

9.4.5. WCDMA BAND 4

Limit		1710	1755	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ -13dBm	F high @ -13dBm		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	1710.1708	1745.8514		
Extreme (50C)		1710.1708	1745.8514	11.5	0.007
Extreme (40C)		1710.1708	1745.8514	10.3	0.006
Extreme (30C)		1710.1708	1745.8514	-4.6	-0.003
Extreme (10C)		1710.1708	1745.8514	1.1	0.001
Extreme (0C)		1710.1708	1745.8514	-7.8	-0.005
Extreme (-10C)		1710.1708	1745.8514	-12.6	-0.007
Extreme (-20C)		1710.1708	1745.8514	-15.2	-0.009
Extreme (-30C)		1710.1708	1745.8514	-11.7	-0.007
20C	15%	1710.1708	1745.8514	-1.9	-0.001
	-15%	1710.1708	1745.8514	-7.5	-0.004
	End Point	1710.1708	1745.8514	-8.7	-0.005

9.5. PEAK-TO-AVERAGE POWER RATIO

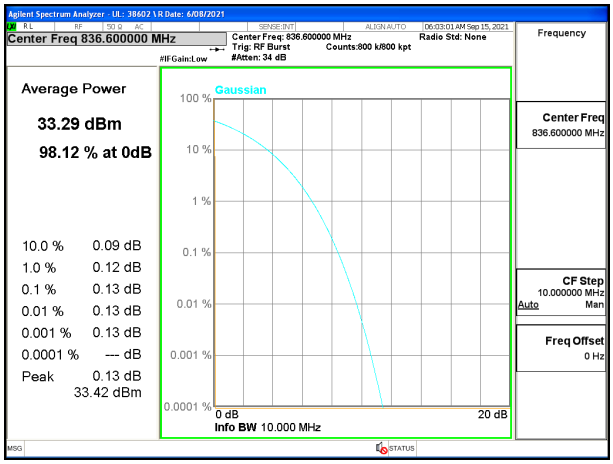
LIMIT

In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

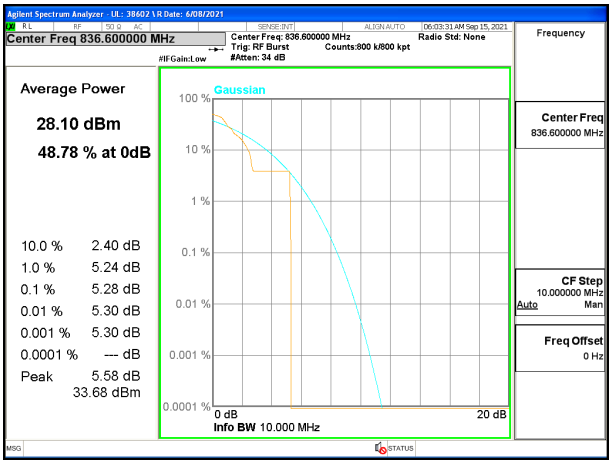
RESULT

Ant 1 was used to measure as the worst case. The results from all CCDF plots are passed with 13dB peak-to-average power ratio criteria.

9.5.1. GSM 850

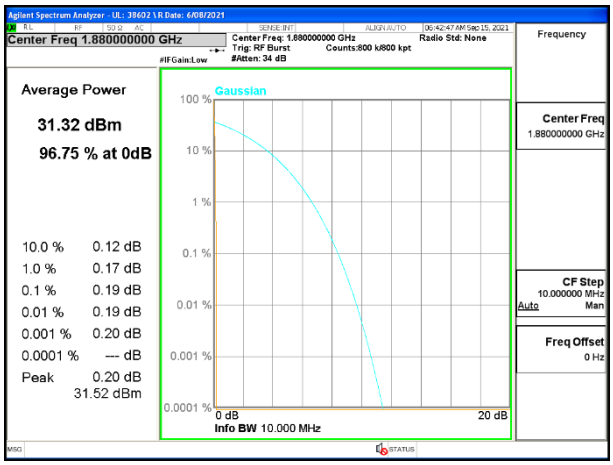


GSM 850 GPRS Middle Channel

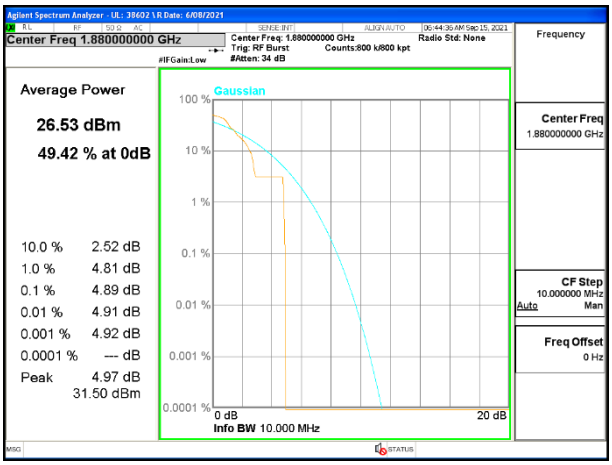


GSM 850 EGPRS Middle Channel

9.5.2. GSM 1900

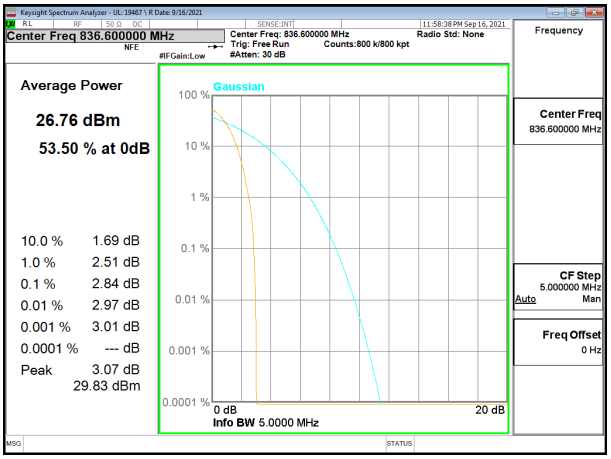


GSM 1900 GPRS Middle Channel

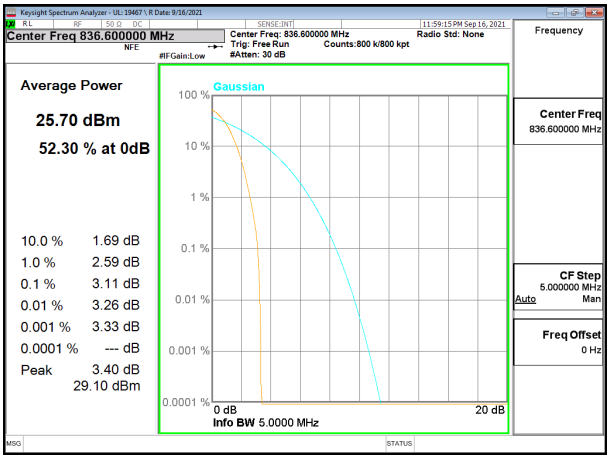


GSM 1900 EGPRS Middle Channel

9.5.3. WCDMA BAND 5

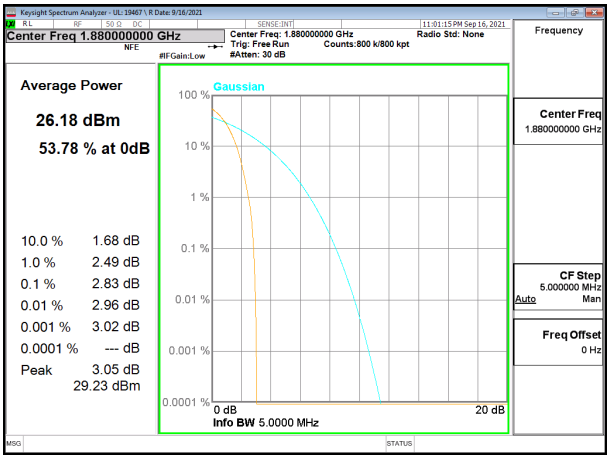


WCDMA Band 5 Rel 99 Middle Channel

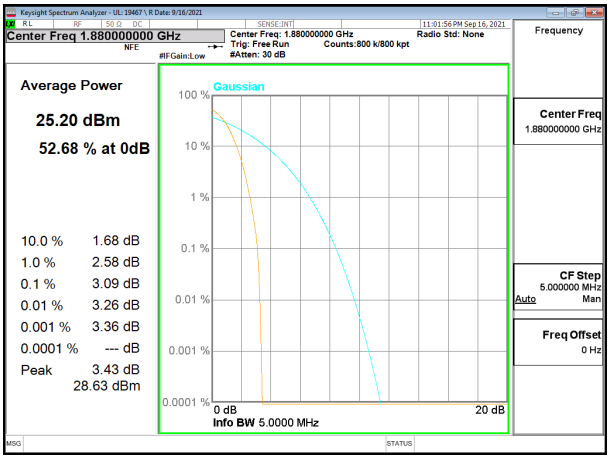


WCDMA Band 5 HSDPA Middle Channel

9.5.4. WCDMA BAND 2

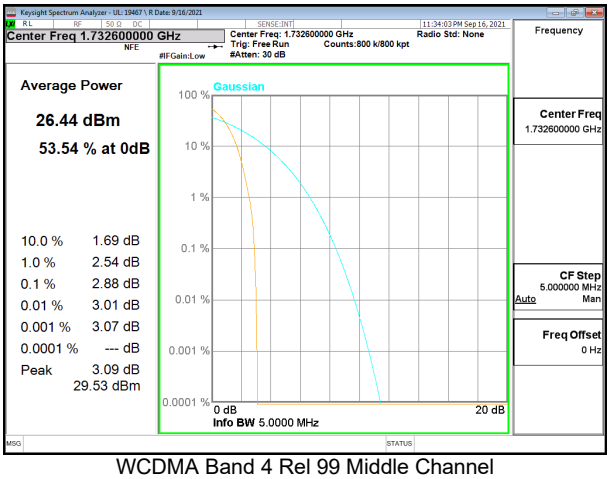


WCDMA Band 2 Rel 99 Middle Channel

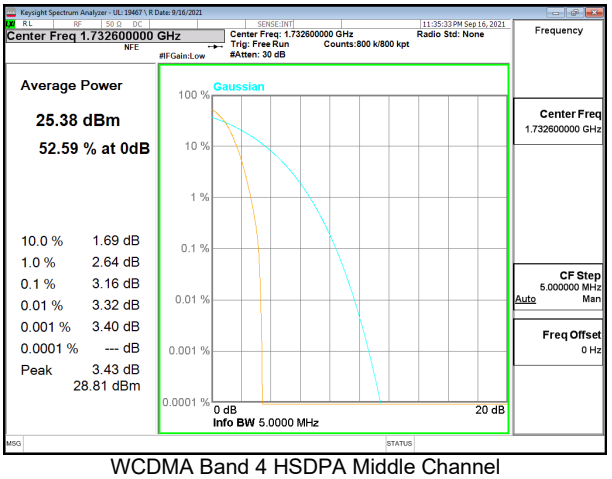


WCDMA Band 2 HSDPA Middle Channel

9.5.5. WCDMA BAND 4



WCDMA Band 4 Rel 99 Middle Channel



WCDMA Band 4 HSDPA Middle Channel

10. RADIATED TEST RESULTS

Radiated measurement using the Field Strength Method

Using the test configuration shown in Figure 6 below, We measure the radiated emissions directly from the EUT and convert the measured field strength or received power to ERP or EIRP, as required, for comparison to the applicable limits. As stated in 5.5.1 of ANSI C63.26-2015, the field strength measurement method using a test site validated to the requirements of ANSI C63.4 is an alternative to the substitution measurement method.

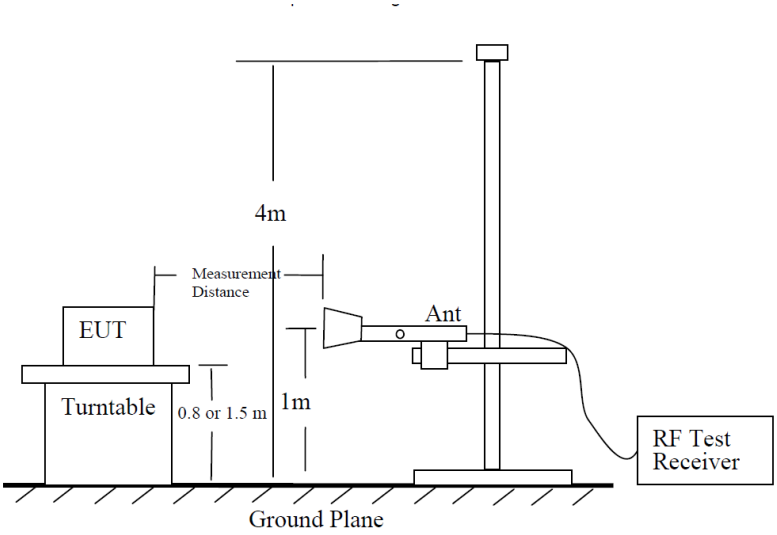


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

Radiated Power Measurement Calculation According to ANSI C63.26-2015

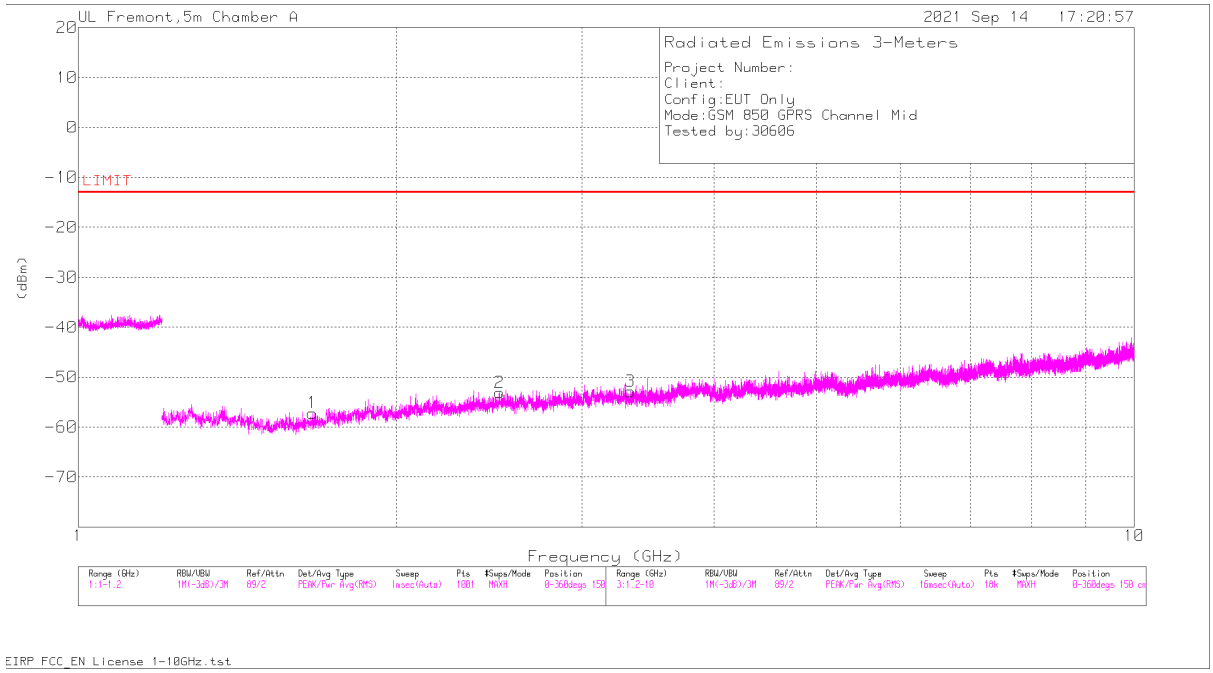
a) E (dBµV/m) = Measured amplitude level (dBµV) + Cable Loss (dB) + Antenna Factor (dB/m).
b) E (dBµV/m) = Measured amplitude level (dBm) + 107 + Cable Loss (dB) + Antenna Factor (dB/m).
c) E (dBµV/m) = EIRP (dBm) − 20log(D) + 104.8; where D is the measurement distance (in the far field region) in m.
d) EIRP (dBm) = E (dBµV/m) + 20log(D) − 104.8; where D is the measurement distance (in the far field region) in m.

So, from d)
The measuring distance is usually at 3m, then 20*Log(3)=9.5424

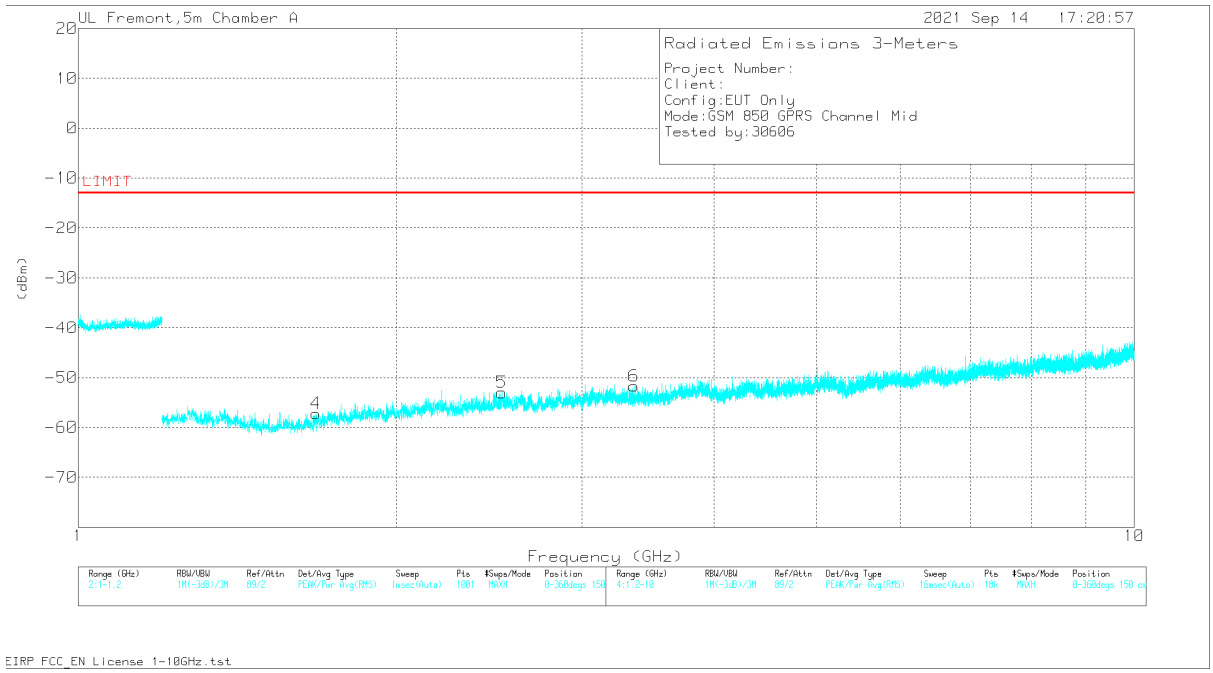
Then, EIRP (dBm) = E (dBµV/m) + 9.5424 − 104.8 = E (dBµV/m) – 95.2576

Note that: we do confidence check to our chambers every day to see if any degradation from expected/normal reading reference data. Also we do ambient check to all our chambers every month.

10.1. Example Plot



Horizontal Polarity



Vertical Polarity

Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF 80402 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
1.66353	39.3	Pk	28.5	-29.4	.8	-95.2	-56	-13	-43	H
1.67661	39.74	Pk	28.4	-29.3	.7	-95.2	-55.66	-13	-42.66	V
2.50185	38.18	Pk	32.3	-28	.6	-95.2	-52.12	-13	-39.12	H
2.52133	37.72	Pk	32.4	-28.1	.8	-95.2	-52.38	-13	-39.38	V
3.33667	37.29	Pk	32.6	-26.6	.5	-95.2	-51.41	-13	-38.41	H
3.36311	37.16	Pk	32.8	-26.6	.6	-95.2	-51.24	-13	-38.24	V

10.2. FIELD STRENGTH OF SPURIOUS RADIATION, Ant 1

RULE PART(S)

FCC: §2.1053, §22.917, §24.238, and §27.53.
ISED: RSS132§5.5; RSS133§6.5 and RSS139§6.6

LIMIT

FCC: §22.917(a), §24.238(a), §27.53 (h)
The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log (P) dB.

RSS132§5.5
Mobile and base station equipment shall comply with the limits in (i) and (ii) below.

(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p (watts).

(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least43 + 10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

RSS133§6.5.1
Equipment shall comply with the limits in (i) and (ii) below.

(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p(watts).

(ii) After the first 1.0 MHz, the emission power in any 1 MHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10p (watts). If the measurement is performed using 1% of the emission bandwidth, power integration over 1.0 MHz is required.

RSS139§6.6

(i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block,Footnote2 which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least43 + 10 log10 p (watts) dB.

(ii) After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.

TEST PROCEDURE

KDB 971168 D01

RESULTS

10.2.1. GSM 850

GPRS MODE

Project #:	13911916
Date:	09/13/2021
Test Engineer:	19226
Configuration:	EUT Only
Mode:	GSM850 GPRS
Chamber #:	Chamber S

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Corrected Reading (dBm)	Limit	Margin (dB)	Polarity
Low Channel, 824.2 MHz										
1.64858	54.63	Pk	28.4	-45.1	.7	-95.2	-56.57	-13	-43.57	V
1.64943	55.24	Pk	28.4	-45.1	.8	-95.2	-55.86	-13	-42.86	H
2.47103	54.82	Pk	32.1	-45	.5	-95.2	-52.78	-13	-39.78	V
2.47403	54.8	Pk	32.1	-45	.5	-95.2	-52.8	-13	-39.8	H
3.29511	50.95	Pk	32.4	-41.8	.8	-95.2	-52.85	-13	-39.85	H
3.29646	50.24	Pk	32.4	-41.8	.8	-95.2	-53.56	-13	-40.56	V
Mid Channel, 836.6 MHz										
1.67233	55.2	Pk	28.5	-45	.7	-95.2	-55.8	-13	-42.8	H
1.67302	55.5	Pk	28.5	-45	.7	-95.2	-55.5	-13	-42.5	V
2.50949	55.89	Pk	32.3	-44.9	.7	-95.2	-51.21	-13	-38.21	H
2.51059	54.86	Pk	32.3	-44.9	.7	-95.2	-52.24	-13	-39.24	V
3.34443	50.93	Pk	32.2	-41.8	.5	-95.2	-53.37	-13	-40.37	V
3.34457	50.51	Pk	32.2	-41.8	.5	-95.2	-53.79	-13	-40.79	H
High Channel, 848.8 MHz										
1.69612	54.59	Pk	28.7	-45	.7	-95.2	-56.21	-13	-43.21	V
1.69757	54.63	Pk	28.7	-45	.6	-95.2	-56.27	-13	-43.27	H
2.54484	53.18	Pk	32.2	-44.8	.6	-95.2	-54.02	-13	-41.02	V
2.54516	54.34	Pk	32.2	-44.8	.6	-95.2	-52.86	-13	-39.86	H
3.39466	50.99	Pk	32.5	-41.7	.6	-95.2	-52.81	-13	-39.81	V
3.39553	50.68	Pk	32.5	-41.7	.6	-95.2	-53.12	-13	-40.12	H

EGPRS MODE

Project #:	13911916
Date:	09/13/2021
Test Engineer:	19226
Configuration:	EUT Only
Mode:	GSM850 EGPRS
Chamber #:	Chamber S

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Corrected Reading (dBm)	Limit	Margin (dB)	Polarity
Low Channel, 824.2 MHz										
1.64738	53.9	Pk	28.4	-45.1	.7	-95.2	-57.30	-13	-44.30	V
1.64763	53.75	Pk	28.4	-45.1	.7	-95.2	-57.45	-13	-44.45	H
2.47221	56.77	Pk	32.1	-45	.5	-95.2	-50.83	-13	-37.83	V
2.47445	56.86	Pk	32.1	-45	.5	-95.2	-50.74	-13	-37.74	H
3.2976	48.39	Pk	32.4	-41.8	.8	-95.2	-55.41	-13	-42.41	V
3.2983	49.42	Pk	32.4	-41.8	.8	-95.2	-54.38	-13	-41.38	H
Mid Channel, 836.6 MHz										
1.67144	54.81	Pk	28.4	-45.1	.7	-95.2	-56.39	-13	-43.39	V
1.6727	54.63	Pk	28.5	-45	.7	-95.2	-56.37	-13	-43.37	H
2.50799	54.23	Pk	32.3	-44.9	.7	-95.2	-52.87	-13	-39.87	H
2.5102	54.19	Pk	32.3	-44.9	.7	-95.2	-52.91	-13	-39.91	V
3.34442	50.35	Pk	32.2	-41.8	.5	-95.2	-53.95	-13	-40.95	V
3.34472	50.44	Pk	32.2	-41.8	.5	-95.2	-53.86	-13	-40.86	H
High Channel, 848.8 MHz										
1.69626	56.76	Pk	28.7	-45	.7	-95.2	-54.04	-13	-41.04	V
1.69713	57.34	Pk	28.7	-45	.6	-95.2	-53.56	-13	-40.56	H
2.54443	55.51	Pk	32.2	-44.8	.6	-95.2	-51.69	-13	-38.69	V
2.54634	55.82	Pk	32.2	-44.8	.6	-95.2	-51.38	-13	-38.38	H
3.3941	52.46	Pk	32.5	-41.8	.6	-95.2	-51.44	-13	-38.44	H
3.39512	52.25	Pk	32.5	-41.7	.6	-95.2	-51.55	-13	-38.55	V

10.2.2. GSM 1900

GPRS MODE

Project #:	13911916
Date:	12/9/2021
Test Engineer:	26120
Configuration;	EUT Only
Mode:	GPRS1900
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
3.700313	39.99	Pk	33.2	-32.3	-95.2	-54.31	-13	-41.31	H
3.700313	38.06	Pk	33.2	-32.3	-95.2	-56.24	-13	-43.24	V
5.550469	36.45	Pk	34.9	-29.7	-95.2	-53.55	-13	-40.55	H
5.550469	35.8	Pk	34.9	-29.7	-95.2	-54.20	-13	-41.20	V
7.400625	33.86	Pk	35.7	-26.3	-95.2	-51.94	-13	-38.94	H
7.400625	33.04	Pk	35.7	-26.3	-95.2	-52.76	-13	-39.76	V
Mid Channel, 1880MHz									
3.759844	38.1	Pk	33.5	-32.1	-95.2	-55.70	-13	-42.70	H
3.759844	37.67	Pk	33.5	-32.1	-95.2	-56.13	-13	-43.13	V
5.64	37.58	Pk	35	-30.1	-95.2	-52.72	-13	-39.72	H
5.64	36.11	Pk	35	-30.1	-95.2	-54.19	-13	-41.19	V
7.520156	34.69	Pk	35.7	-26.1	-95.2	-50.91	-13	-37.91	H
7.520156	33.19	Pk	35.7	-26.1	-95.2	-52.41	-13	-39.41	V
High Channel, 1909.8MHz									
3.819844	39.36	Pk	33.7	-31.8	-95.2	-53.94	-13	-40.94	H
3.819844	39.38	Pk	33.7	-31.8	-95.2	-53.92	-13	-40.92	V
5.729531	34.93	Pk	34.8	-29	-95.2	-54.47	-13	-41.47	H
5.729531	35.4	Pk	34.8	-29	-95.2	-54.00	-13	-41.00	V
7.639688	34.48	Pk	35.9	-26.5	-95.2	-51.32	-13	-38.32	H
7.639688	32.73	Pk	35.9	-26.5	-95.2	-53.07	-13	-40.07	V

EGPRS MODE

Project #:	13911916
Date:	12/9/2021
Test Engineer:	26120
Configuration;	EUT Only
Mode:	GSM1900
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
3.700313	38.53	Pk	33.2	-32.3	-95.2	-55.77	-13	-42.77	H
3.700313	38.73	Pk	33.2	-32.3	-95.2	-55.57	-13	-42.57	V
5.55	35.39	Pk	34.9	-29.7	-95.2	-54.61	-13	-41.61	H
5.55	35.52	Pk	34.9	-29.7	-95.2	-54.48	-13	-41.48	V
7.400625	33.87	Pk	35.7	-26.3	-95.2	-51.93	-13	-38.93	H
7.400625	34.12	Pk	35.7	-26.3	-95.2	-51.68	-13	-38.68	V
Mid Channel, 1880MHz									
3.759844	39.57	Pk	33.5	-32.1	-95.2	-54.23	-13	-41.23	H
3.759844	39.81	Pk	33.5	-32.1	-95.2	-53.99	-13	-40.99	V
5.64	35.38	Pk	35	-30.1	-95.2	-54.92	-13	-41.92	H
5.64	36.88	Pk	35	-30.1	-95.2	-53.42	-13	-40.42	V
7.520156	32.92	Pk	35.7	-26.1	-95.2	-52.68	-13	-39.68	H
7.520156	34.23	Pk	35.7	-26.1	-95.2	-51.37	-13	-38.37	V
High Channel, 1909.8MHz									
3.819844	38.19	Pk	33.7	-31.8	-95.2	-55.11	-13	-42.11	H
3.819844	38.23	Pk	33.7	-31.8	-95.2	-55.07	-13	-42.07	V
5.729531	36.02	Pk	34.8	-29	-95.2	-53.38	-13	-40.38	H
5.729531	36.01	Pk	34.8	-29	-95.2	-53.39	-13	-40.39	V
7.639219	33.74	Pk	35.9	-26.5	-95.2	-52.06	-13	-39.06	H
7.639219	33.22	Pk	35.9	-26.5	-95.2	-52.58	-13	-39.58	V

10.2.3. WCDMA BAND 5

REL 99 MODE

Project #:	13911916
Date:	09/20/2021
Test Engineer:	26120
Configuration;	EUT Only
Mode:	REL 99 Band 5
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Corrected Reading (dBm)	Limit	Margin (dB)	Polarity
Low Channel, 826.4MHz										
1.65431	43.92	Pk	28.3	-34.9	.8	-95.2	-57.08	-13	-44.08	V
1.65436	43.73	Pk	28.3	-34.9	.8	-95.2	-57.27	-13	-44.27	H
2.47868	43.99	Pk	32.5	-34.8	.5	-95.2	-53.01	-13	-40.01	H
2.47969	44.44	Pk	32.6	-34.8	.5	-95.2	-52.46	-13	-39.46	V
3.30527	42.97	Pk	32.6	-33.8	.7	-95.2	-52.73	-13	-39.73	H
3.30542	43.04	Pk	32.6	-33.8	.7	-95.2	-52.66	-13	-39.66	V
Mid Channel, 836.6MHz										
1.6716	45.41	Pk	28.4	-34.9	.7	-95.2	-55.59	-13	-42.59	H
1.67414	44.54	Pk	28.4	-34.9	.7	-95.2	-56.46	-13	-43.46	V
2.51048	44.24	Pk	32.7	-34.7	.7	-95.2	-52.26	-13	-39.26	V
2.51144	44.19	Pk	32.7	-34.7	.7	-95.2	-52.31	-13	-39.31	H
3.34645	42.56	Pk	32.5	-33.7	.6	-95.2	-53.24	-13	-40.24	V
3.34706	43.56	Pk	32.5	-33.7	.6	-95.2	-52.24	-13	-39.24	H
High Channel, 846.6MHz										
1.69344	44.38	Pk	28.8	-34.9	.7	-95.2	-56.22	-13	-43.22	H
1.69411	43.91	Pk	28.8	-34.9	.7	-95.2	-56.69	-13	-43.69	V
2.508	43.63	Pk	32.7	-34.7	.7	-95.2	-52.87	-13	-39.87	H
2.5085	43.63	Pk	32.7	-34.7	.7	-95.2	-52.87	-13	-39.87	V
3.3458	42.54	Pk	32.5	-33.7	.6	-95.2	-53.26	-13	-40.26	V
3.3485	42.41	Pk	32.5	-33.7	.6	-95.2	-53.39	-13	-40.39	H

HSDPA MODE

Project #:	13911916
Date:	09/21/2021
Test Engineer:	45258
Configuration;	EUT Only
Mode:	HSDPA Band 5
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Corrected Reading (dBm)	Limit	Margin (dB)	Polarity
Low Channel, 826.4MHz										
1.65141	44.69	Pk	28.4	-34.9	.8	-95.2	-56.21	-13	-43.21	H
1.65198	43.95	Pk	28.4	-34.9	.8	-95.2	-56.95	-13	-43.95	V
2.48034	45.29	Pk	32.6	-34.8	.5	-95.2	-51.61	-13	-38.61	H
2.48069	43.67	Pk	32.6	-34.8	.5	-95.2	-53.23	-13	-40.23	V
3.30396	43.83	Pk	32.6	-33.8	.7	-95.2	-51.87	-13	-38.87	V
3.3057	43.76	Pk	32.6	-33.8	.7	-95.2	-51.94	-13	-38.94	H
Mid Channel, 836.6MHz										
1.67506	46.01	Pk	28.4	-34.9	.7	-95.2	-54.99	-13	-41.99	V
1.67523	50.93	Pk	28.4	-34.9	.7	-95.2	-50.07	-13	-37.07	H
2.50859	44.2	Pk	32.7	-34.7	.7	-95.2	-52.3	-13	-39.3	V
2.50949	43.78	Pk	32.7	-34.7	.7	-95.2	-52.72	-13	-39.72	H
3.34552	43.34	Pk	32.5	-33.7	.6	-95.2	-52.46	-13	-39.46	V
3.34793	42.46	Pk	32.5	-33.7	.6	-95.2	-53.34	-13	-40.34	H
High Channel, 846.6MHz										
1.67212	42.83	Pk	28.4	-34.9	.7	-95.2	-58.17	-13	-45.17	H
1.6723	43.05	Pk	28.4	-34.9	.7	-95.2	-57.95	-13	-44.95	V
2.53639	51.11	Pk	32.6	-34.7	.8	-95.2	-45.39	-13	-32.39	H
2.53701	47.71	Pk	32.6	-34.7	.8	-95.2	-48.79	-13	-35.79	V
3.38596	41.94	Pk	32.6	-33.5	.6	-95.2	-53.56	-13	-40.56	H
3.3867	43.04	Pk	32.5	-33.5	.6	-95.2	-52.56	-13	-39.56	V

10.2.4. WCDMA BAND 2

REL 99 MODE

Project #:	13911916
Date:	09/22/2021
Test Engineer:	45258
Configuration;	EUT Only
Mode:	REL 99 Band 2
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.70326	42.37	Pk	33.2	-32.3	-95.2	-51.93	-13	-38.93	H
3.70564	42.18	Pk	33.2	-32.3	-95.2	-52.12	-13	-39.12	V
5.55631	39.38	Pk	34.9	-29.6	-95.2	-50.52	-13	-37.52	V
5.55781	39.52	Pk	34.9	-29.6	-95.2	-50.38	-13	-37.38	H
7.41029	38.59	Pk	35.7	-26.3	-95.2	-47.21	-13	-34.21	H
7.41102	37.63	Pk	35.7	-26.3	-95.2	-48.17	-13	-35.17	V
Mid Channel, 1880MHz									
3.7583	42.42	Pk	33.5	-32.1	-95.2	-51.38	-13	-38.38	H
3.75842	43.15	Pk	33.5	-32.1	-95.2	-50.65	-13	-37.65	V
5.63835	40.13	Pk	35	-30	-95.2	-50.07	-13	-37.07	H
5.63996	40.57	Pk	35	-30.1	-95.2	-49.73	-13	-36.73	V
7.51948	36.95	Pk	35.7	-26.1	-95.2	-48.65	-13	-35.65	H
7.51978	37.56	Pk	35.7	-26.1	-95.2	-48.04	-13	-35.04	V
High Channel, 1907.6MHz									
3.81299	42.35	Pk	33.6	-31.8	-95.2	-51.05	-13	-38.05	V
3.81388	42.58	Pk	33.7	-31.8	-95.2	-50.72	-13	-37.72	H
5.72151	39.75	Pk	34.8	-29.1	-95.2	-49.75	-13	-36.75	V
5.72432	39.53	Pk	34.8	-29	-95.2	-49.87	-13	-36.87	H
7.6312	37.01	Pk	35.8	-26.5	-95.2	-48.89	-13	-35.89	V
7.63135	37.49	Pk	35.8	-26.5	-95.2	-48.41	-13	-35.41	H

HSDPA MODE

Project #:	13911916
Date:	09/16/2021
Test Engineer:	45258
Configuration;	EUT Only
Mode:	HSDPA Band 2
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.70565	42.17	Pk	33.2	-32.3	-95.2	-52.13	-13	-39.13	V
3.71111	43.47	Pk	33.3	-32.3	-95.2	-50.73	-13	-37.73	H
5.55709	40.93	Pk	34.9	-29.6	-95.2	-48.97	-13	-35.97	H
5.55864	40.63	Pk	34.9	-29.7	-95.2	-49.37	-13	-36.37	V
7.40998	37.09	Pk	35.7	-26.3	-95.2	-48.71	-13	-35.71	H
7.41058	37.37	Pk	35.7	-26.3	-95.2	-48.43	-13	-35.43	V
Mid Channel, 1880MHz									
3.76038	42.61	Pk	33.6	-32	-95.2	-50.99	-13	-37.99	H
3.76146	42.53	Pk	33.6	-32	-95.2	-51.07	-13	-38.07	V
5.53943	40.08	Pk	34.9	-29.6	-95.2	-49.82	-13	-36.82	V
5.54166	39.54	Pk	34.9	-29.6	-95.2	-50.36	-13	-37.36	H
7.51834	36.95	Pk	35.7	-26.1	-95.2	-48.65	-13	-35.65	H
7.52013	37.59	Pk	35.7	-26.1	-95.2	-48.01	-13	-35.01	V
High Channel, 1907.6MHz									
3.8154	42.34	Pk	33.7	-31.8	-95.2	-50.96	-13	-37.96	H
3.8157	42.11	Pk	33.7	-31.8	-95.2	-51.19	-13	-38.19	V
5.72274	40	Pk	34.8	-29.1	-95.2	-49.5	-13	-36.5	H
5.7229	40.44	Pk	34.8	-29.1	-95.2	-49.06	-13	-36.06	V
7.62961	37.52	Pk	35.8	-26.6	-95.2	-48.48	-13	-35.48	V
7.62982	37.42	Pk	35.8	-26.6	-95.2	-48.58	-13	-35.58	H

10.2.5. WCDMA BAND 4

REL 99 MODE

Project #:	13911916
Date:	09/17/2021
Test Engineer:	45258
Configuration;	EUT Only
Mode:	REL 99 Band 4
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.42534	43.02	Pk	32.6	-33	-95.2	-52.58	-13	-39.58	H
3.42657	43.24	Pk	32.6	-33	-95.2	-52.36	-13	-39.36	V
5.13608	40.86	Pk	34.2	-29.9	-95.2	-50.04	-13	-37.04	H
5.13695	40.95	Pk	34.2	-29.9	-95.2	-49.95	-13	-36.95	V
6.84919	37.92	Pk	35.7	-26.8	-95.2	-48.38	-13	-35.38	V
6.84921	37.29	Pk	35.7	-26.8	-95.2	-49.01	-13	-36.01	H
Mid Channel, 1732.6MHz									
3.46419	43.98	Pk	32.8	-33	-95.2	-51.42	-13	-38.42	H
3.46669	42.71	Pk	32.8	-33	-95.2	-52.69	-13	-39.69	V
5.19663	40.38	Pk	34.2	-29.1	-95.2	-49.72	-13	-36.72	V
5.19751	40.49	Pk	34.2	-29.1	-95.2	-49.61	-13	-36.61	H
6.92911	37.62	Pk	35.8	-26.1	-95.2	-47.88	-13	-34.88	V
6.93159	37.79	Pk	35.8	-26	-95.2	-47.61	-13	-34.61	H
High Channel, 1752.61MHz									
3.50588	42.59	Pk	33	-32.9	-95.2	-52.51	-13	-39.51	V
3.50597	42.58	Pk	33	-32.9	-95.2	-52.52	-13	-39.52	H
5.2565	38.69	Pk	34.2	-29	-95.2	-51.31	-13	-38.31	H
5.25969	40.06	Pk	34.2	-29	-95.2	-49.94	-13	-36.94	V
7.01244	37.01	Pk	35.7	-26.5	-95.2	-48.99	-13	-35.99	H
7.01408	37.49	Pk	35.7	-26.6	-95.2	-48.61	-13	-35.61	V

HSDPA MODE

Project #:	13911916
Date:	09/17/2021
Test Engineer:	45258
Configuration;	EUT Only
Mode:	REL 99 Band 4
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1712MHz									
3.42625	43.92	Pk	32.6	-33	-95.2	-51.68	-13	-38.68	H
3.42684	43.31	Pk	32.6	-33	-95.2	-52.29	-13	-39.29	V
5.13521	41.1	Pk	34.2	-30	-95.2	-49.9	-13	-36.9	H
5.13561	41.17	Pk	34.2	-30	-95.2	-49.83	-13	-36.83	V
6.84909	37.44	Pk	35.7	-26.8	-95.2	-48.86	-13	-35.86	V
6.85013	37.24	Pk	35.7	-26.8	-95.2	-49.06	-13	-36.06	H
Mid Channel, 1732.6MHz									
3.46379	42.23	Pk	32.8	-33	-95.2	-53.17	-13	-40.17	V
3.46568	42.16	Pk	32.8	-33	-95.2	-53.24	-13	-40.24	H
5.19615	39.59	Pk	34.2	-29.1	-95.2	-50.51	-13	-37.51	H
5.199	40.23	Pk	34.2	-29.2	-95.2	-49.97	-13	-36.97	V
6.93099	36.9	Pk	35.8	-26	-95.2	-48.5	-13	-35.5	V
6.93151	37.63	Pk	35.8	-26	-95.2	-47.77	-13	-34.77	H
High Channel, 1752.6MHz									
3.5027	42.76	Pk	33	-32.9	-95.2	-52.34	-13	-39.34	H
3.50555	42.57	Pk	33	-32.9	-95.2	-52.53	-13	-39.53	V
5.25729	39.67	Pk	34.2	-29	-95.2	-50.33	-13	-37.33	H
5.25739	39.29	Pk	34.2	-29	-95.2	-50.71	-13	-37.71	V
7.00882	37.51	Pk	35.7	-26.5	-95.2	-48.49	-13	-35.49	V
7.00887	37.11	Pk	35.7	-26.5	-95.2	-48.89	-13	-35.89	H

10.3. FIELD STRENGTH OF SPURIOUS RADIATION, Ant 2

10.3.1. GSM 850

GPRS MODE

Project #:	13911916
Date:	09/17/2021
Test Engineer:	30606
Configuration;	EUT Only
Mode:	GSM850 GPRS
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Corrected Reading (dBm)	Limit	Margin (dB)	Polarity
Low Channel, 824.2 MHz										
1.63999	39.84	Pk	28.5	-29.4	.7	-95.2	-55.56	-13	-42.56	V
1.64484	38.66	Pk	28.5	-29.4	.7	-95.2	-56.74	-13	-43.74	H
2.47521	37.88	Pk	32.2	-28.1	.5	-95.2	-52.72	-13	-39.72	H
2.48064	37.88	Pk	32.2	-28.1	.5	-95.2	-52.72	-13	-39.72	V
3.29556	37.58	Pk	32.6	-26.4	.8	-95.2	-50.62	-13	-37.62	V
3.29944	36.91	Pk	32.6	-26.4	.8	-95.2	-51.29	-13	-38.29	H
Mid Channel, 836.6 MHz										
1.66353	39.3	Pk	28.5	-29.4	.8	-95.2	-56.00	-13	-43.00	H
1.67661	39.74	Pk	28.4	-29.3	.7	-95.2	-55.66	-13	-42.66	V
2.50185	38.18	Pk	32.3	-28	.6	-95.2	-52.12	-13	-39.12	H
2.52133	37.72	Pk	32.4	-28.1	.8	-95.2	-52.38	-13	-39.38	V
3.33667	37.29	Pk	32.6	-26.6	.5	-95.2	-51.41	-13	-38.41	H
3.36311	37.16	Pk	32.8	-26.6	.6	-95.2	-51.24	-13	-38.24	V
High Channel, 848.8 MHz										
1.68801	39	Pk	28.4	-29.2	.7	-95.2	-56.30	-13	-43.30	H
1.69507	39.38	Pk	28.6	-29.2	.7	-95.2	-55.72	-13	-42.72	V
2.53671	38.36	Pk	32.3	-27.9	.7	-95.2	-51.74	-13	-38.74	H
2.5496	37.44	Pk	32.3	-27.7	.6	-95.2	-52.56	-13	-39.56	V
3.39323	37.62	Pk	32.7	-26.3	.6	-95.2	-50.58	-13	-37.58	H
3.39832	36.4	Pk	32.7	-26.3	.6	-95.2	-51.80	-13	-38.80	V

EGPRS MODE

Project #:	13911916
Date:	09/14/2021
Test Engineer:	30606
Configuration;	EUT Only
Mode:	GSM850 EGPRS
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Corrected Reading (dBm)	Limit	Margin (dB)	Polarity
Low Channel, 824.2 MHz										
1.63981	39.95	Pk	28.5	-29.4	.7	-95.2	-55.45	-13	-42.45	V
1.65659	38.55	Pk	28.5	-29.4	.8	-95.2	-56.75	-13	-43.75	H
2.4714	38.34	Pk	32.2	-28.2	.5	-95.2	-52.36	-13	-39.36	H
2.49255	38.09	Pk	32.2	-28	.6	-95.2	-52.31	-13	-39.31	V
3.29052	37.49	Pk	32.6	-26.4	.8	-95.2	-50.71	-13	-37.71	H
3.29972	36.36	Pk	32.6	-26.4	.8	-95.2	-51.84	-13	-38.84	V
Mid Channel, 836.6 MHz										
1.68513	38.97	Pk	28.4	-29.2	.7	-95.2	-56.33	-13	-43.33	H
1.70024	39.16	Pk	28.7	-29.2	.6	-95.2	-55.94	-13	-42.94	V
2.53524	37.7	Pk	32.3	-27.9	.7	-95.2	-52.4	-13	-39.4	V
2.54178	37.64	Pk	32.2	-27.8	.7	-95.2	-52.46	-13	-39.46	H
3.39316	36.54	Pk	32.7	-26.3	.6	-95.2	-51.66	-13	-38.66	V
3.39691	36.65	Pk	32.7	-26.3	.6	-95.2	-51.55	-13	-38.55	H
High Channel, 848.8 MHz										
1.70326	38.99	Pk	28.8	-29.2	.6	-95.2	-56.01	-13	-43.01	V
1.70553	38.65	Pk	28.8	-29.2	.6	-95.2	-56.35	-13	-43.35	H
2.52974	38.05	Pk	32.4	-28	.8	-95.2	-51.95	-13	-38.95	V
2.5479	37.08	Pk	32.3	-27.7	.6	-95.2	-52.92	-13	-39.92	H
3.38435	36.41	Pk	32.8	-26.4	.6	-95.2	-51.79	-13	-38.79	H
3.38734	37.62	Pk	32.8	-26.4	.6	-95.2	-50.58	-13	-37.58	V

10.3.2. GSM 1900

GPRS MODE

Project #:	13911916
Date:	12/9/2021
Test Engineer:	26227
Configuration;	EUT Only
Mode:	GSM1900 GPRS
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
3.681563	40.95	Pk	33.2	-32.4	-95.2	-53.45	-13	-40.45	H
3.683438	41.4	Pk	33.2	-32.4	-95.2	-53.00	-13	-40.00	V
5.717344	37.85	Pk	34.8	-29.2	-95.2	-51.75	-13	-38.75	H
5.725243	40.37	Pk	34.8	-29	-95.2	-49.03	-13	-36.03	V
8.409526	36.64	Pk	35.9	-24.5	-95.2	-47.16	-13	-34.16	V
8.4075	34.95	Pk	35.9	-24.5	-95.2	-48.85	-13	-35.85	H
Mid Channel, 1880MHz									
3.771094	39.28	Pk	33.5	-32	-95.2	-54.42	-13	-41.42	V
3.771563	40.4	Pk	33.5	-32	-95.2	-53.30	-13	-40.30	H
5.62875	38.49	Pk	35.1	-30	-95.2	-51.61	-13	-38.61	H
5.63625	38.7	Pk	35	-30	-95.2	-51.50	-13	-38.50	V
7.511719	35.35	Pk	35.7	-26.2	-95.2	-50.35	-13	-37.35	V
7.522969	34.97	Pk	35.8	-26.1	-95.2	-50.53	-13	-37.53	H
High Channel, 1909.8MHz									
3.840938	39.36	Pk	33.6	-31.8	-95.2	-54.04	-13	-41.04	V
3.851719	39.52	Pk	33.6	-31.8	-95.2	-53.88	-13	-40.88	H
6.310781	38.66	Pk	35.9	-27.5	-95.2	-48.14	-13	-35.14	V
6.317109	37.15	Pk	35.9	-27.4	-95.2	-49.55	-13	-36.55	H
7.658906	36.47	Pk	35.8	-26.6	-95.2	-49.53	-13	-36.53	V
7.659375	36.65	Pk	35.8	-26.6	-95.2	-49.35	-13	-36.35	H

EGPRS MODE

Project #:	13911916
Date:	12/9/2021
Test Engineer:	39006
Configuration;	EUT Only
Mode:	GSM1900 EGPRS
Chamber #:	Chamber B

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
3.681563	39.9	Pk	33.2	-32.4	-95.2	-54.50	-13	-41.50	V
3.707344	39.13	Pk	33.2	-32.3	-95.2	-55.17	-13	-42.17	H
5.521875	35.21	Pk	34.9	-29.6	-95.2	-54.69	-13	-41.69	V
5.550469	35.9	Pk	34.9	-29.7	-95.2	-54.10	-13	-41.10	H
7.343438	34.95	Pk	35.7	-26.6	-95.2	-51.15	-13	-38.15	V
7.36875	33.99	Pk	35.7	-26.5	-95.2	-52.01	-13	-39.01	H
Mid Channel, 1880MHz									
3.790781	38.26	Pk	33.6	-31.9	-95.2	-55.24	-13	-42.24	H
3.794063	41.6	Pk	33.6	-31.9	-95.2	-51.90	-13	-38.90	V
5.627344	35.59	Pk	35.1	-29.9	-95.2	-54.41	-13	-41.41	V
5.641406	39.87	Pk	35	-30.1	-95.2	-50.43	-13	-37.43	H
7.522031	32.18	Pk	35.8	-26.1	-95.2	-53.32	-13	-40.32	H
7.522031	32.08	Pk	35.8	-26.1	-95.2	-53.42	-13	-40.42	V
High Channel, 1909.8MHz									
3.803906	37.12	Pk	33.6	-31.8	-95.2	-56.28	-13	-43.28	V
3.817031	38.57	Pk	33.7	-31.8	-95.2	-54.73	-13	-41.73	H
5.705156	36.35	Pk	34.8	-29.3	-95.2	-53.35	-13	-40.35	V
5.724844	35.7	Pk	34.8	-29	-95.2	-53.70	-13	-40.70	H
7.612969	33.32	Pk	35.8	-26.4	-95.2	-52.48	-13	-39.48	V
7.639219	32.91	Pk	35.9	-26.5	-95.2	-52.89	-13	-39.89	H

10.3.3. WCDMA BAND 5

REL 99 MODE

Project #:	13911916
Date:	09/9/2021
Test Engineer:	30606
Configuration;	EUT Only
Mode:	REL 99 Band 5
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Corrected Reading (dBm)	Limit	Margin (dB)	Polarity
Low Channel, 826.4MHz										
1.65384	40.54	Pk	28.5	-29.4	.8	-95.2	-54.76	-13	-41.76	H
1.66108	39.72	Pk	28.5	-29.4	.8	-95.2	-55.58	-13	-42.58	V
2.47756	38.22	Pk	32.2	-28.1	.5	-95.2	-52.38	-13	-39.38	V
2.47767	38.12	Pk	32.2	-28.1	.5	-95.2	-52.48	-13	-39.48	H
3.2967	36.81	Pk	32.6	-26.4	.8	-95.2	-51.39	-13	-38.39	H
3.2988	37.58	Pk	32.6	-26.4	.8	-95.2	-50.62	-13	-37.62	V
Mid Channel, 836.6MHz										
1.66651	39.3	Pk	28.5	-29.4	.7	-95.2	-56.1	-13	-43.1	H
1.67728	39.39	Pk	28.4	-29.3	.7	-95.2	-56.01	-13	-43.01	V
2.49597	37.77	Pk	32.2	-28	.6	-95.2	-52.63	-13	-39.63	H
2.51104	38.19	Pk	32.4	-28.1	.7	-95.2	-52.01	-13	-39.01	V
3.34239	37.05	Pk	32.6	-26.5	.5	-95.2	-51.55	-13	-38.55	V
3.34566	37.11	Pk	32.6	-26.5	.5	-95.2	-51.49	-13	-38.49	H
High Channel, 846.6MHz										
1.69769	39.63	Pk	28.7	-29.2	.6	-95.2	-55.47	-13	-42.47	V
1.70851	39.31	Pk	28.8	-29.2	.6	-95.2	-55.69	-13	-42.69	H
2.53861	38.32	Pk	32.2	-27.8	.7	-95.2	-51.78	-13	-38.78	V
2.54084	38.02	Pk	32.2	-27.8	.7	-95.2	-52.08	-13	-39.08	H
3.38353	37.47	Pk	32.8	-26.4	.6	-95.2	-50.73	-13	-37.73	V
3.39182	36.85	Pk	32.8	-26.4	.6	-95.2	-51.35	-13	-38.35	H

HSDPA MODE

Project #:	13911916
Date:	09/9/2021
Test Engineer:	30606
Configuration;	EUT Only
Mode:	HSDPA Band 5
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Corrected Reading (dBm)	Limit	Margin (dB)	Polarity
Low Channel, 826.4MHz										
1.64022	39.44	Pk	28.5	-29.4	.7	-95.2	-55.96	-13	-42.96	H
1.66373	39.72	Pk	28.5	-29.4	.8	-95.2	-55.58	-13	-42.58	V
2.48197	38.79	Pk	32.2	-28.1	.5	-95.2	-51.81	-13	-38.81	V
2.48563	37.7	Pk	32.2	-28	.5	-95.2	-52.8	-13	-39.8	H
3.2993	36.78	Pk	32.6	-26.4	.8	-95.2	-51.42	-13	-38.42	H
3.30004	37.98	Pk	32.6	-26.4	.8	-95.2	-50.22	-13	-37.22	V
Mid Channel, 836.6MHz										
1.66403	39.47	Pk	28.5	-29.4	.8	-95.2	-55.83	-13	-42.83	V
1.66861	38.99	Pk	28.5	-29.4	.7	-95.2	-56.41	-13	-43.41	H
2.50548	37.89	Pk	32.3	-28	.7	-95.2	-52.31	-13	-39.31	V
2.51066	37.98	Pk	32.4	-28.1	.7	-95.2	-52.22	-13	-39.22	H
3.35743	37.32	Pk	32.8	-26.6	.6	-95.2	-51.08	-13	-38.08	V
3.35807	37.35	Pk	32.7	-26.6	.6	-95.2	-51.15	-13	-38.15	H
High Channel, 846.6MHz										
1.68418	39.42	Pk	28.4	-29.2	.7	-95.2	-55.88	-13	-42.88	H
1.7879	38.42	Pk	29.8	-29.2	.6	-95.2	-55.58	-13	-42.58	V
2.52358	37.9	Pk	32.4	-28.1	.8	-95.2	-52.2	-13	-39.2	V
2.52432	38.39	Pk	32.4	-28.1	.8	-95.2	-51.71	-13	-38.71	H
3.36672	37.58	Pk	32.8	-26.6	.6	-95.2	-50.82	-13	-37.82	V
3.38294	36.51	Pk	32.8	-26.4	.6	-95.2	-51.69	-13	-38.69	H

10.3.4. WCDMA BAND 2

REL 99 MODE

Project #:	13911916
Date:	09/8/2021
Test Engineer:	30606
Configuration;	EUT Only
Mode:	REL 99 Band 2
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.70301	36.05	Pk	33.3	-25.2	-95.2	-51.05	-13	-38.05	V
3.72259	36.5	Pk	33.4	-24.9	-95.2	-50.20	-13	-37.20	H
5.5384	34.13	Pk	34.7	-22.5	-95.2	-48.87	-13	-35.87	V
5.58307	34.03	Pk	34.8	-22.2	-95.2	-48.57	-13	-35.57	H
7.38832	32.88	Pk	35.5	-19.6	-95.2	-46.42	-13	-33.42	V
7.43244	32.18	Pk	35.6	-20.1	-95.2	-47.52	-13	-34.52	H
Mid Channel, 1880MHz									
3.74222	35.97	Pk	33.4	-25.1	-95.2	-50.93	-13	-37.93	V
3.75445	36.03	Pk	33.4	-25	-95.2	-50.77	-13	-37.77	H
5.63506	34.2	Pk	34.8	-22.1	-95.2	-48.3	-13	-35.3	H
5.63999	34.25	Pk	34.8	-22	-95.2	-48.15	-13	-35.15	V
7.53248	32.75	Pk	35.6	-19.5	-95.2	-46.35	-13	-33.35	H
7.54095	31.56	Pk	35.6	-19.4	-95.2	-47.44	-13	-34.44	V
High Channel, 1907.6MHz									
3.80973	36.72	Pk	33.3	-25.3	-95.2	-50.48	-13	-37.48	H
3.81991	36.61	Pk	33.3	-25.2	-95.2	-50.49	-13	-37.49	V
5.72802	33.99	Pk	34.9	-23.2	-95.2	-49.51	-13	-36.51	H
5.75143	34.88	Pk	35	-23.3	-95.2	-48.62	-13	-35.62	V
7.62067	32.22	Pk	35.7	-18.5	-95.2	-45.78	-13	-32.78	V
7.63374	32.19	Pk	35.7	-18.4	-95.2	-45.71	-13	-32.71	H

HSDPA MODE

Project #:	13911916
Date:	09/8/2021
Test Engineer:	30606
Configuration;	EUT Only
Mode:	HSDPA Band 2
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.71051	36.16	Pk	33.4	-25	-95.2	-50.64	-13	-37.64	H
3.72027	35.98	Pk	33.4	-24.9	-95.2	-50.72	-13	-37.72	V
5.53569	33.34	Pk	34.7	-22.5	-95.2	-49.66	-13	-36.66	H
5.55822	34.06	Pk	34.7	-22.6	-95.2	-49.04	-13	-36.04	V
7.38862	31.5	Pk	35.5	-19.6	-95.2	-47.8	-13	-34.8	V
7.3899	32.17	Pk	35.5	-19.6	-95.2	-47.13	-13	-34.13	H
Mid Channel, 1880MHz									
3.75636	36.15	Pk	33.4	-24.9	-95.2	-50.55	-13	-37.55	V
3.7721	36.84	Pk	33.3	-24.8	-95.2	-49.86	-13	-36.86	H
5.64304	34.07	Pk	34.8	-21.9	-95.2	-48.23	-13	-35.23	V
5.64679	34.9	Pk	34.8	-21.9	-95.2	-47.40	-13	-34.40	H
7.53036	32	Pk	35.6	-19.6	-95.2	-47.20	-13	-34.20	H
7.53136	32.61	Pk	35.6	-19.6	-95.2	-46.59	-13	-33.59	V
High Channel, 1907.6MHz									
3.81703	36.51	Pk	33.3	-25.2	-95.2	-50.59	-13	-37.59	H
3.8175	36.26	Pk	33.3	-25.2	-95.2	-50.84	-13	-37.84	V
5.73281	33.98	Pk	35	-23.3	-95.2	-49.52	-13	-36.52	H
5.73656	33.8	Pk	35	-23.3	-95.2	-49.70	-13	-36.70	V
7.61484	32.1	Pk	35.7	-18.6	-95.2	-46.00	-13	-33.00	H
7.64391	31.57	Pk	35.7	-18.4	-95.2	-46.33	-13	-33.33	V

10.3.5. WCDMA BAND 4

REL 99 MODE

Project #:	13911916
Date:	09/10/2021
Test Engineer:	30606
Configuration;	EUT Only
Mode:	REL 99 Band 4
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.4042	37.1	Pk	32.8	-25.9	-95.2	-51.20	-13	-38.20	H
3.4384	37.01	Pk	32.7	-26.1	-95.2	-51.59	-13	-38.59	V
5.13077	35.03	Pk	34.4	-23.2	-95.2	-48.97	-13	-35.97	V
5.14502	35.32	Pk	34.3	-23.4	-95.2	-48.98	-13	-35.98	H
6.86111	32.5	Pk	35.5	-20.9	-95.2	-48.10	-13	-35.10	H
6.86171	32.52	Pk	35.5	-20.9	-95.2	-48.08	-13	-35.08	V
Mid Channel, 1732.6MHz									
3.45048	37.64	Pk	32.7	-26.1	-95.2	-50.96	-13	-37.96	V
3.48688	36.99	Pk	32.6	-25.6	-95.2	-51.21	-13	-38.21	H
5.19447	35.08	Pk	34.4	-24	-95.2	-49.72	-13	-36.72	V
5.20229	35.87	Pk	34.4	-23.9	-95.2	-48.83	-13	-35.83	H
6.9223	33.19	Pk	35.5	-20.8	-95.2	-47.31	-13	-34.31	V
6.94463	33.44	Pk	35.5	-20.4	-95.2	-46.66	-13	-33.66	H
High Channel, 1752.6MHz									
3.49298	37.05	Pk	32.6	-25.6	-95.2	-51.15	-13	-38.15	H
3.60095	37.05	Pk	32.8	-25	-95.2	-50.35	-13	-37.35	V
5.25079	35.27	Pk	34.4	-23.4	-95.2	-48.93	-13	-35.93	V
5.28065	35	Pk	34.4	-23.6	-95.2	-49.40	-13	-36.40	H
7.00888	31.83	Pk	35.5	-19.6	-95.2	-47.47	-13	-34.47	H
7.02423	32.41	Pk	35.5	-19.7	-95.2	-46.99	-13	-33.99	V

HSDPA MODE

Project #:	13911916
Date:	09/10/2021
Test Engineer:	30606
Configuration;	EUT Only
Mode:	HSDPA Band 4
Chamber #:	Chamber A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	Amp/Cbl (dB)	EIRP CF	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.43127	37.07	Pk	32.7	-26.1	-95.2	-51.53	-13	-38.53	V
3.45404	37.3	Pk	32.6	-26.1	-95.2	-51.40	-13	-38.40	H
5.1161	35.45	Pk	34.4	-22.9	-95.2	-48.25	-13	-35.25	H
5.1516	35.65	Pk	34.4	-23.5	-95.2	-48.65	-13	-35.65	V
6.84392	32.69	Pk	35.5	-20.7	-95.2	-47.71	-13	-34.71	H
6.86031	32.88	Pk	35.5	-20.8	-95.2	-47.62	-13	-34.62	V
Mid Channel, 1732.6MHz									
3.44934	37.44	Pk	32.7	-26.1	-95.2	-51.16	-13	-38.16	V
3.45493	37.3	Pk	32.6	-26.1	-95.2	-51.40	-13	-38.40	H
5.17367	35.43	Pk	34.4	-24	-95.2	-49.37	-13	-36.37	H
5.20201	34.93	Pk	34.4	-23.9	-95.2	-49.77	-13	-36.77	V
6.953	33.02	Pk	35.5	-20.4	-95.2	-47.08	-13	-34.08	V
6.95554	32.34	Pk	35.5	-20.4	-95.2	-47.76	-13	-34.76	H
High Channel, 1752.6MHz									
3.5024	36.95	Pk	32.8	-25.5	-95.2	-50.95	-13	-37.95	H
3.50327	37.46	Pk	32.8	-25.5	-95.2	-50.44	-13	-37.44	V
5.25982	34.37	Pk	34.4	-23.4	-95.2	-49.83	-13	-36.83	H
5.26394	34.37	Pk	34.4	-23.4	-95.2	-49.83	-13	-36.83	V
6.99494	33.12	Pk	35.5	-19.7	-95.2	-46.28	-13	-33.28	H
6.99743	32.26	Pk	35.5	-19.6	-95.2	-47.04	-13	-34.04	V

11. SETUP PHOTOS

Please refer to 13911916-EP1V1 for setup photos

END OF REPORT