

TEST REPORT

Report Number: 14523744-E8V2

Applicant : APPLE, INC
1 APPLE PARK WAY
CUPERTINO, CA 95014, U.S.A.

Model : A3101

Brand : APPLE

FCC ID : BCG-E8436A

IC : 579C-E8436A

EUT Description : SMARTPHONE

Test Standard(s) : FCC 47 CFR PART 22H, 24E, AND 27L
ISED RSS-GEN ISSUE 5, RSS-132 ISSUE 4, RSS-133
ISSUE 6, AND RSS-139 ISSUE 4

Date Of Issue:

2023-08-07

Prepared by:

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Revision History

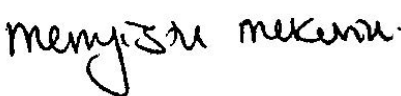


<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V1	2023-07-10	Initial Review	Mengistu Mekuria
V2	2023-08-07	Addressed TCB Feedback Section 9, 10	Andrew Le

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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	A3101	
Brand	APPLE	
FCC ID	BCG-E8436A	
IC	579C-E8436A	
EUT Description	SMARTPHONE	
Serial Number	PNYQ97FW23, HFYYJNPY1W, XV07R41DQX (CONDUCTED) AND MKDCGFM9N5, YRVHP7P03H (RADIATED)	
Sample Receipt Date	2022-11-01	
Date Tested	2022-11-01 TO 2023-06-26	
Applicable Standards	FCC 47 CFR Part 2, Part 22, Part 24, and Part 27 ISED RSS-GEN ISSUE 5, RSS-132 Issue 4, RSS-133 Issue 6, RSS-139 Issue 4.	
Test Results	COMPLIES	
<p>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.</p> <p>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.</p> <p>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.</p>		
Approved & Released By:	Reviewed By:	Prepared By:
		
Mengistu Mekuria Staff Engineer UL LLC.	Tewodros Woldemichael Laboratory Engineer UL LLC.	Matthew Wu Laboratory Engineer UL LLC.

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,	-	Complies	
Effective Radiated Power	22.913 (a)(5)	RSS132§5.4	Complies	
Equivalent Isotropic Radiated power	24.232 (c), 27.50 (d) (4)	RSS133§6.4 & SRSP-510, 5.1.2 RSS139§5.5	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§5.6	Complies	
Out of Band Emissions	2.1051, 22.917 (a), 24.238 (a), 27.53 (h),	RSS132§5.5 RSS133§6.5 RSS139§5.6	Complies	
Frequency Stability	2.1055, 22.355, 24.235, 27.54	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§5.5	Complies	
Field Strength of Spurious Radiation	2.1053, 22.917 (a), 24.238 (a), 27.53 (h),	RSS132§5.5 RSS133§6.5 RSS139§5.6	Complies	

3. TEST METHODOLOGY

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

- ANSI C63.26:2015
- FCC 47 CFR Part 2, Part 22, Part 24, and Part 27.
- [FCC KDB 971168 D01 v03r01](#): Power Meas License Digital Systems
- [FCC KDB 971168 D02 v02r02](#): Misc Rev Approv License Devices
- [FCC KDB 412172 D01 v01r01](#). Determining ERP and EIRP
- ISED RSS-GEN Issue 5, ISED RSS-132 Issue 4, RSS-133 Issue 6, RSS-139 Issue 4.

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc 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
<input checked="" type="checkbox"/>	Building 1: 47173 Benicia Street, Fremont, CA 94538, USA	US0104	2324A	550739
<input checked="" type="checkbox"/>	Building 2: 47266 Benicia Street, Fremont, CA 94538, USA			
<input type="checkbox"/>	Building 3: 843 Auburn Court, Fremont, CA 94538, USA			
<input type="checkbox"/>	Building 4: 47658 Kato Rd, Fremont, CA 94538, USA			
<input type="checkbox"/>	Building 5: 47670 Kato Rd, Fremont, CA 94538, USA			

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}
Conducted Antenna Port Emission Measurement	1.940
Power Spectral Density	2.466
Time Domain Measurements Using SA	3.39
RF Power Measurement Direct Method Using Power Meter	0.450 Peak; 1.300 Ave.
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 db
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 db
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 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

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)

$$36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} = 28.9 \text{ dBuV/m}$$

6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

The Apple iPhone is a smartphone with cellular GSM, GPRS, EGPRS, UMTS, LTE, 5G NR1, IEEE 802.11a/b/g/n/ac/ax, Bluetooth (BT), Ultra-Wideband (UWB), GPS, NFC, 802.15ab-NB and MSS technologies. The rechargeable battery is not user accessible.

6.2. MAXIMUM OUTPUT POWER

EIRP/ERP TEST PROCEDURE

ANSI C63.26:2015
KDB 971168 D01 Section 5.6

$$\text{ERP/EIRP} = \text{PMeas} + \text{GT} - \text{LC}$$

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(Ant1)								
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	33.50	-5.60	3.0	25.75	0.376	244.79	245KGXW
	EGPRS	28.00			20.25	0.106	238.73	239KG7W
Part 22 850MHz(Ant1)								
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	33.50	-5.60	7.0	25.75	0.376	244.79	245KGXW
	EGPRS	28.00			20.25	0.106	238.73	239KG7W
Part 24 / RSS 133 1900MHz(Ant3)								
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	31.50	-1.80	2.0	29.70	0.933	239.49	239KGXW
	EGPRS	26.50			24.70	0.295	243.74	244KG7W

WCDMA MODE

RSS 132 Band 5(Ant1)								
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	-5.60	3.0	17.95	0.062	4137	4M14F9W
	HSDPA	25.67			17.92	0.062	4150	4M15F9W
Part 22 Band 5(Ant1)								
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	-5.60	7.0	17.95	0.062	4137	4M14F9W
	HSDPA	25.67			17.92	0.062	4150	4M15F9W
Part 24 / RSS 133 Band 2(Ant3)								
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	25.50	-1.80	2.0	23.70	0.234	4154	4M15F9W
	HSDPA	25.06			23.26	0.212	4148	4M15F9W
Part 27 / RSS 139 Band 4(Ant1)								
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	-3.20	1.0	22.50	0.178	4145	4M15F9W
	HSDPA	25.69			22.49	0.177	4161	4M16F9W

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

Frequency Band	ANT 1 Antenna Gain (dBi)	ANT 2 Antenna Gain (dBi)	ANT 3 Antenna Gain (dBi)	ANT 4 Antenna Gain (dBi)
GSM850 and WCDMA 5 824 – 849MHz	-5.6	-5.4		
GSM1900 and WCDMA 2 1850 – 1910 MHz	-2.9	-2.8	-1.8	-2.0
WCDMA 4 1710 – 1755 MHz	-3.2	-3.3	-3.0	-1.3

6.5. WORST-CASE CONFIGURATION AND MODE

The EUT was investigated in three orthogonal orientations X/Y/Z on all ANT 1, ANT2, ANT3 and ANT4 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	ANT3	ANT4
824 – 849 MHz	Z	Z	N/A	N/A
1710 – 1915 MHz	Y	X	Y	Y

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

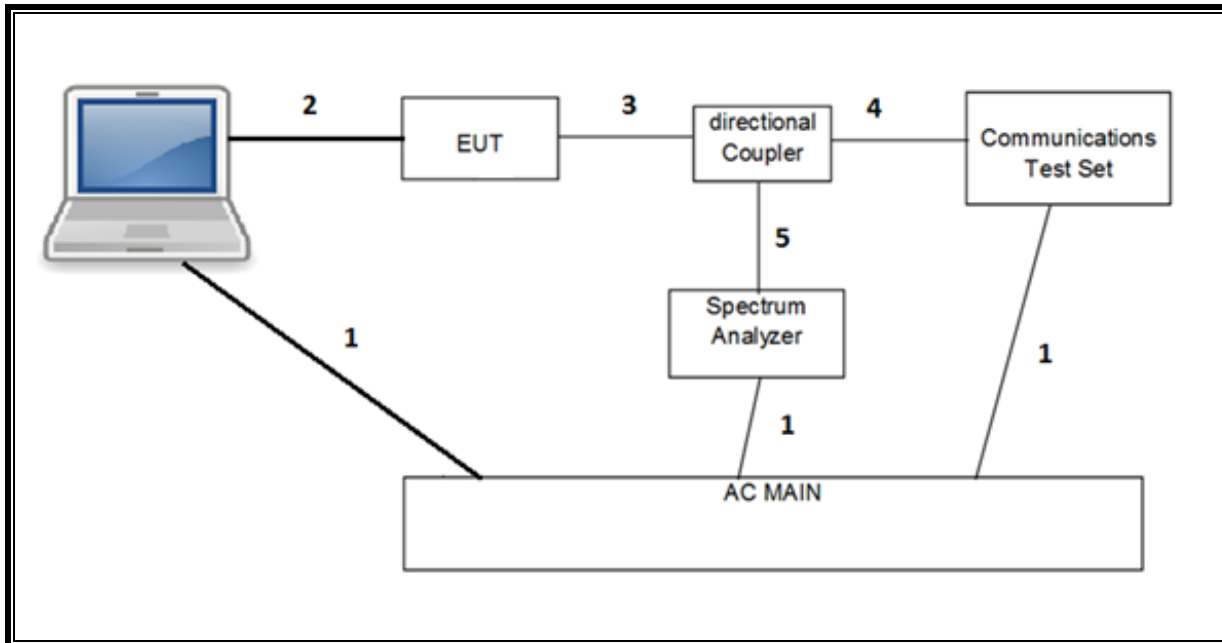
Radiated spurious emissions were investigated from 9kHz to 30MHz, 30MHz-1GHz and above 1GHz. There were no emissions found with less than 20dB of margin from 9kHz to 1GHz.

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.

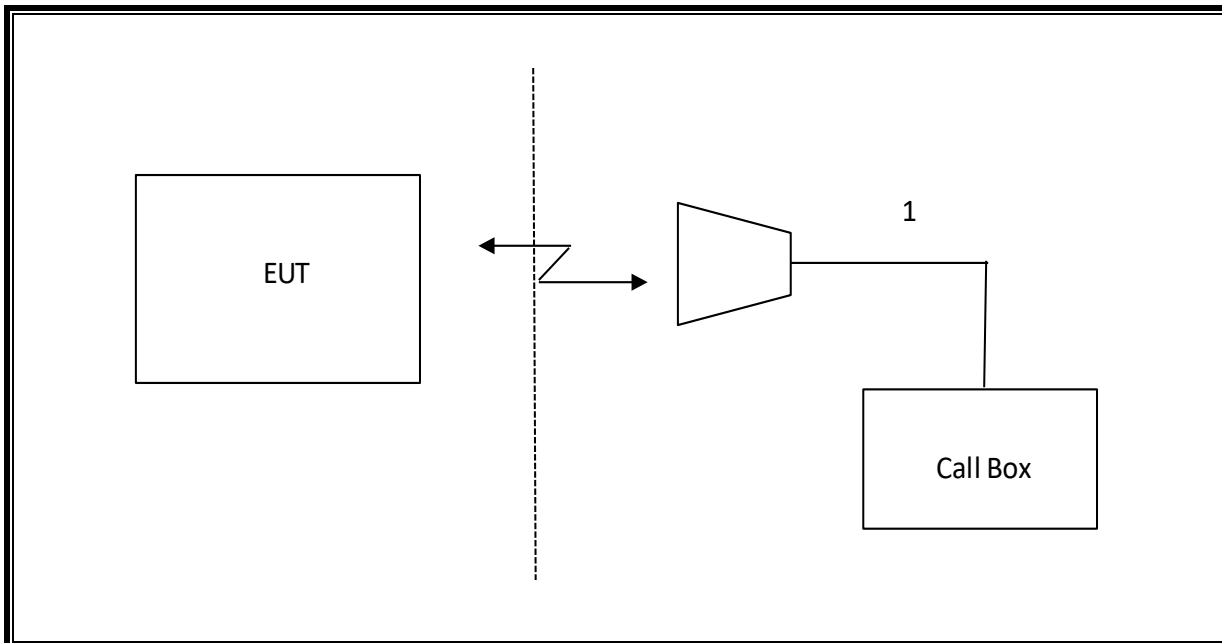
6.6. DESCRIPTION OF TEST SETUP

SUPPORT TEST EQUIPMENT						
Description	Manufacturer	Model	Serial Number	FCC ID/ DoC		
Laptop	Apple	MacBook Pro	HRP082673	BCGA1708		
AC/DC adapter	Apple	A1718	C4H64450HH3GN8RA6	--		
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	79834	06/08/2023
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences	JB3	85151	04/30/2024
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	85313	02/29/2024
Spectrum Analyzer, PXA	Keysight	N9030B	222074	07/16/2023
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight	N9030A	85201	02/29/2024
Spectrum Analyzer, PXA	Keysight	N9030B	85214	07/18/2023
Spectrum Analyzer, PXA	Keysight	N9030B	222073	07/22/2023
PXA Signal Analyzer	Keysight	N9030B	222073	07/22/2023
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	230548	02/29/2024
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	201498	02/29/2024
Directional Coupler	KRYTAR	152610	198816	09/23/2023
Directional Coupler	KRYTAR	152610	198817	09/23/2023
Directional Coupler	KRYTAR	152610	135712	09/23/2023
Power Meter, P-series single channel	Keysight	N1912A	90630	01/24/2024
Power Meter, P-series single channel	Keysight	N1912A	90719	01/31/2024
Power Meter, P-series single channel	Agilent	N1911A	82174	01/31/2024
Power Sensor, P- series, 50MHz to 18GHz, Wideband	Keysight	N1921A	90389	01/31/2024
Filter, BRF 2495 – 2690 MHz	Micro-Tronics	155050	155055	12/28/2023
Filter, BRF 3.4 – 3.8GHz	Micro-Tronics	208398	208398	08/19/2023
Wideband Communication Test Set, Call Box	Rohde & Schwarz	CMW500	222792	02/29/2024
Wideband Communication Test Set, Call Box	Rohde & Schwarz	CMW500	230298	02/29/2024
Wideband Communication Test Set, Call Box	Rohde & Schwarz	CMW500	230295	02/29/2024
Wideband Communication Test Set, Call Box	Rohde & Schwarz	CMW500	22796	02/29/2024
Wideband Communication Test Set, Call Box	Rohde & Schwarz	CMW500	230297	02/29/2024
*5G NR Communication Test Set, Call Box	Keysight	UXM	207269	01/31/2024
*5G NR Communication Test Set, Call Box	Keysight	UXM	199836	01/31/2024
*Chamber, Environmental	Cincinnati Sub Zero	ZPHS-8-3.5-SCT/WC	82472	11/16/2023
*Amplifier, 218GHz to 26.5GHz	Ampical	AMP18G26.5-60	215705	02/26/2023
*Amplifier, 26.5GHz to 40GHz	Ampical	AMP26G40-65	172346	02/29/20224
Antenna, Horn 18 to 26.5GHz	ARA	MWH-1826/B	172362	03/31/2024
Antenna, Horn 26.5GHz to 40GHz	ARA	MWH-2640/B	172365	03/31/2024
*Antenna, Active Loop 100KHz to 30MHz	ELECTRO-METRICS	EM-6872	219911	05/10/2023
*Antenna, Active Loop 30Hz to 1MHz	ELECTRO-METRICS	EM-6871	219909	05/10/2023
10dB Fixed Attenuator	Pasternack Enterprises	PE7087-10	236360	N/A
10dB Fixed Attenuator	Pasternack Enterprises	PE7087-10	236285	N/A
10dB Fixed Attenuator	Pasternack Enterprises	PE7087-10	236355	N/A
UL AUTOMATION SOFTWARE				
CLT Software	UL	UL RF	Ver 3.4, May 20, 2022	
Power Measurement Software	UL	UL RF	Ver 3.1.4, April 29, 2022	
Radiated test software	UL	UL RF	Ver 9.5, Jan 21, 2022	

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:

8.1. 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:	12482	Test Date:	11/30/2022
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Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Conducted Average Power (dBm)	
					ANT 1	ANT 2
GPRS (GMSK)	CS1	1	128	824.2	33.05	32.12
			190	836.6	32.77	31.87
			251	848.8	33.50	32.50
		2	128	824.2	32.27	31.27
			190	836.6	32.50	31.50
			251	848.8	32.25	31.28
EGPRS (8PSK)	MCS5	1	128	824.2	27.65	26.61
			190	836.6	27.49	26.41
			251	848.8	28.00	27.00
		2	128	824.2	27.00	25.85
			190	836.6	26.99	26.00
			251	848.8	26.82	25.94

8.1.2. GSM 1900

Test Engineer ID:	12482	Test Date:	11/30/2022
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Mode	Coding Scheme	Time Slots	Ch No.	Freq. (MHz)	Conducted Average Power (dBm)			
					ANT 1	ANT 2	ANT 3	ANT 4
GPRS (GMSK)	CS1	1	512	1850.2	31.88	29.17	31.50	28.96
			661	1880.0	31.64	28.95	31.35	28.68
			810	1909.8	32.00	29.50	31.45	29.00
		2	512	1850.2	30.86	28.50	30.08	28.00
			661	1880.0	31.00	28.36	30.50	27.72
			810	1909.8	30.76	28.10	30.45	27.84
EGPRS (8PSK)	MCS5	1	512	1850.2	26.66	23.66	26.50	23.96
			661	1880.0	26.56	22.69	25.74	22.23
			810	1909.8	27.00	24.00	26.43	24.00
		2	512	1850.2	26.00	22.27	24.71	21.28
			661	1880.0	25.91	23.00	25.50	23.00
			810	1909.8	25.61	22.00	24.78	22.01

8.2. 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 \geq RBW \geq 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
	β_c/β_d	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} (Note 1, 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 $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

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 $\Delta_{NACK} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{HS} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{HS}/\beta_c = 24/15$. For all other combinations of DPDCCH, 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 $\beta_c = 11/15$ and $\beta_d = 15/15$.

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} (Note 1)	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	209/25	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_{ed1} : 47/15 β_{ed2} : 47/15	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 $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$. For sub-test 5, Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 5/15$ with $\beta_{hs} = 5/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. 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 $\beta_c = 10/15$ and $\beta_d = 15/15$.

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
<p>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.</p> <p>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.</p>		

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	β_{ed1} : 30/15 β_{ed2} : 30/15	β_{ed3} : 24/15 β_{ed4} : 24/15	3.5	2.5	14	105	105

Note 1: $\Delta_{ACK}, \Delta_{NACK}$ and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$.

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 $\beta_d = 0$ 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

8.2.1. WCDMA BAND 5

Test Engineer ID:	25602/25780	Test Date:	12/8/2022
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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	24.70	
			4183	836.6	N/A	25.69	24.67	
			4233	846.6	N/A	25.64	24.66	
	HSDPA	Subtest 1	4132	826.4	0	25.62	24.33	
			4183	836.6	0	25.60	24.24	
			4233	846.6	0	25.55	24.21	
		Subtest 2	4132	826.4	0	25.67	24.30	
			4183	836.6	0	25.61	24.23	
			4233	846.6	0	25.39	24.22	
		Subtest 3	4132	826.4	0.5	25.15	23.81	
			4183	836.6	0.5	25.45	23.73	
			4233	846.6	0.5	25.06	23.72	
		Subtest 4	4132	826.4	0.5	25.17	23.81	
			4183	836.6	0.5	25.10	23.75	
			4233	846.6	0.5	25.04	23.72	
		HSPA (HSDPA & HSUPA)	Subtest 1	4132	826.4	0	25.45	24.29
				4183	836.6	0	25.38	24.25
				4233	846.6	0	25.38	24.22
	Subtest 2		4132	826.4	2	23.42	22.29	
			4183	836.6	2	23.36	22.24	
			4233	846.6	2	23.39	22.24	
	Subtest 3		4132	826.4	1	24.43	23.30	
			4183	836.6	1	24.37	23.23	
			4233	846.6	1	24.40	23.21	
	Subtest 4		4132	826.4	2	23.45	22.30	
			4183	836.6	2	23.40	22.25	
			4233	846.6	2	23.39	22.23	
	Subtest 5		4132	826.4	0	25.01	23.84	
			4183	836.6	0	24.92	23.80	
			4233	846.6	0	24.97	23.79	
	DC-HSDPA	Subtest 1	4132	826.4	0	25.42	24.29	
			4183	836.6	0	25.38	24.24	
			4233	846.6	0	25.37	24.23	
		Subtest 2	4132	826.4	0	25.46	24.30	
			4183	836.6	0	25.38	24.24	
			4233	846.6	0	25.38	24.20	
		Subtest 3	4132	826.4	0.5	24.94	23.82	
			4183	836.6	0.5	24.88	23.75	
			4233	846.6	0.5	24.87	23.71	
		Subtest 4	4132	826.4	0.5	24.97	23.79	
			4183	836.6	0.5	24.86	23.73	
			4233	846.6	0.5	24.88	23.73	

8.2.2. WCDMA BAND 2

Test Engineer ID:	25602/25780	Test Date:	12/8/2022
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Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)				
						ANT 1	ANT 2	ANT 3	ANT 4	
W-CDMA Band 2 (1900MHz)	Rel 99	RMC, 12.2 kbps	9262	1852.4	N/A	25.69	23.40	25.50	22.90	
			9400	1880.0	N/A	25.70	23.31	25.46	22.75	
			9538	1907.6	N/A	25.66	23.28	25.34	22.77	
	HSDPA	Subtest 1	9262	1852.4	0	25.70	22.67	25.06	22.90	
			9400	1880.0	0	25.68	22.52	24.98	22.73	
			9538	1907.6	0	25.67	22.50	24.89	22.77	
		Subtest 2	9262	1852.4	0	25.70	22.61	24.99	22.90	
			9400	1880.0	0	25.62	22.46	24.96	22.73	
			9538	1907.6	0	25.61	22.47	24.84	22.75	
		Subtest 3	9262	1852.4	0.5	25.23	22.16	24.56	22.51	
			9400	1880.0	0.5	25.18	22.04	24.48	22.34	
			9538	1907.6	0.5	25.18	22.00	24.39	22.33	
		Subtest 4	9262	1852.4	0.5	25.27	22.15	24.52	22.52	
			9400	1880.0	0.5	25.19	22.02	24.48	22.35	
			9538	1907.6	0.5	25.23	22.00	24.36	22.37	
		HSPA (HSDPA & HSUPA)	Subtest 1	9262	1852.4	0	25.36	22.64	24.99	22.90
				9400	1880.0	0	25.26	22.51	24.98	22.78
				9538	1907.6	0	25.30	22.50	24.91	22.82
	Subtest 2		9262	1852.4	2	23.32	20.61	23.01	20.96	
			9400	1880.0	2	23.23	20.48	22.98	20.84	
			9538	1907.6	2	23.22	20.49	22.90	20.84	
	Subtest 3		9262	1852.4	1	24.36	21.61	24.00	21.98	
			9400	1880.0	1	24.25	21.49	23.99	21.83	
			9538	1907.6	1	24.24	21.49	23.89	21.89	
	Subtest 4		9262	1852.4	2	23.34	20.63	23.01	21.00	
			9400	1880.0	2	23.20	20.52	22.98	20.84	
			9538	1907.6	2	23.25	20.49	22.89	20.89	
	Subtest 5		9262	1852.4	0	24.88	22.19	24.54	22.55	
			9400	1880.0	0	24.80	22.07	24.54	22.41	
			9538	1907.6	0	24.82	22.06	24.45	22.44	
	DC-HSDPA	Subtest 1	9262	1852.4	0	25.38	22.67	25.03	22.90	
			9400	1880.0	0	25.29	22.57	25.04	22.78	
			9538	1907.6	0	25.30	22.54	24.92	22.77	
		Subtest 2	9262	1852.4	0	25.36	22.67	25.02	22.86	
			9400	1880.0	0	25.24	22.51	24.98	22.72	
			9538	1907.6	0	25.26	22.47	24.86	22.73	
		Subtest 3	9262	1852.4	0.5	24.86	22.17	24.54	22.44	
			9400	1880.0	0.5	24.74	22.04	24.51	22.24	
			9538	1907.6	0.5	24.78	22.03	24.39	22.27	
		Subtest 4	9262	1852.4	0.5	24.90	22.22	24.58	22.40	
			9400	1880.0	0.5	24.76	22.06	24.49	22.24	
			9538	1907.6	0.5	24.80	22.03	24.39	22.24	

8.2.3. WCDMA BAND 4

Test Engineer ID:	25602	Test Date:	12/12/2022
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Band	Mode		UL Ch No.	Freq. (MHz)	MPR (dB)	Conducted Average Power (dBm)				
						ANT 1	ANT 2	ANT 3	ANT 4	
W-CDMA Band 4 (1700MHz)	Rel 99	RMC, 12.2 kbps	1312	1712.4	N/A	25.70	23.40	25.50	22.90	
			1413	1732.6	N/A	25.64	23.33	25.39	22.90	
			1513	1752.6	N/A	25.61	23.24	25.43	22.88	
	HSDPA	Subtest 1	1312	1712.4	0	25.69	23.04	25.23	22.90	
			1413	1732.6	0	25.55	22.94	25.10	22.89	
			1513	1752.6	0	25.55	22.87	25.17	22.88	
		Subtest 2	1312	1712.4	0	25.60	23.02	25.23	22.90	
			1413	1732.6	0	25.52	22.91	25.08	22.84	
			1513	1752.6	0	25.53	22.84	25.12	22.82	
		Subtest 3	1312	1712.4	0.5	25.14	22.51	24.71	22.69	
			1413	1732.6	0.5	25.02	22.40	24.56	22.66	
			1513	1752.6	0.5	25.02	22.32	24.64	22.66	
		Subtest 4	1312	1712.4	0.5	25.15	22.54	24.76	22.73	
			1413	1732.6	0.5	25.06	22.45	24.62	22.66	
			1513	1752.6	0.5	25.06	22.36	24.67	22.69	
		HSPA (HSDPA & HSUPA)	Subtest 1	1312	1712.4	0	25.62	23.01	25.25	22.90
				1413	1732.6	0	25.57	22.92	25.12	22.90
				1513	1752.6	0	25.54	22.84	25.18	22.90
	Subtest 2		1312	1712.4	2	23.62	21.02	23.22	21.21	
			1413	1732.6	2	23.51	22.93	23.11	21.18	
			1513	1752.6	2	23.54	20.84	23.18	21.21	
	Subtest 3		1312	1712.4	1	24.60	21.98	24.20	22.22	
			1413	1732.6	1	24.53	21.94	24.10	22.18	
			1513	1752.6	1	24.57	21.86	24.16	22.18	
	Subtest 4		1312	1712.4	2	23.62	21.01	23.22	21.22	
			1413	1732.6	2	23.54	20.94	23.11	21.19	
			1513	1752.6	2	23.54	20.85	23.16	21.18	
	Subtest 5		1312	1712.4	0	25.18	22.57	24.64	22.75	
			1413	1732.6	0	25.09	22.48	24.66	22.74	
			1513	1752.6	0	25.08	22.41	24.73	22.78	
	DC-HSDPA	Subtest 1	1312	1712.4	0	25.66	23.04	25.27	22.90	
			1413	1732.6	0	25.57	22.98	25.15	22.88	
			1513	1752.6	0	25.55	22.87	25.17	22.84	
		Subtest 2	1312	1712.4	0	25.65	23.02	25.23	22.90	
			1413	1732.6	0	25.53	22.92	25.07	22.80	
			1513	1752.6	0	25.49	22.84	25.13	22.78	
		Subtest 3	1312	1712.4	0.5	25.12	22.54	24.75	22.71	
			1413	1732.6	0.5	25.04	22.42	24.57	22.64	
			1513	1752.6	0.5	25.02	22.34	24.62	22.62	
		Subtest 4	1312	1712.4	0.5	25.20	22.56	24.78	22.70	
			1413	1732.6	0.5	25.08	22.48	24.61	22.65	
			1513	1752.6	0.5	25.05	22.37	24.66	22.68	

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.

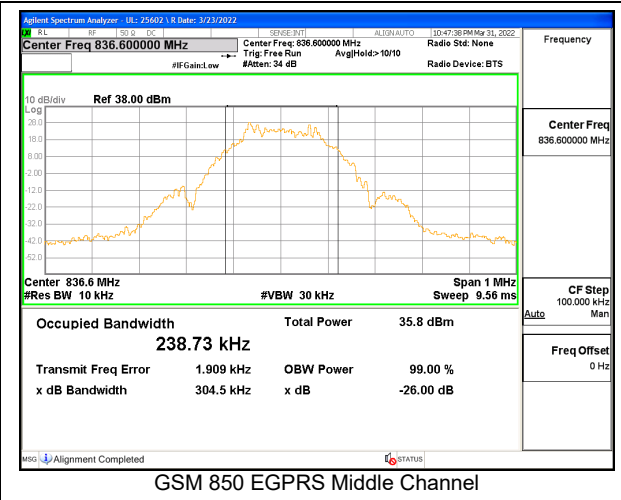
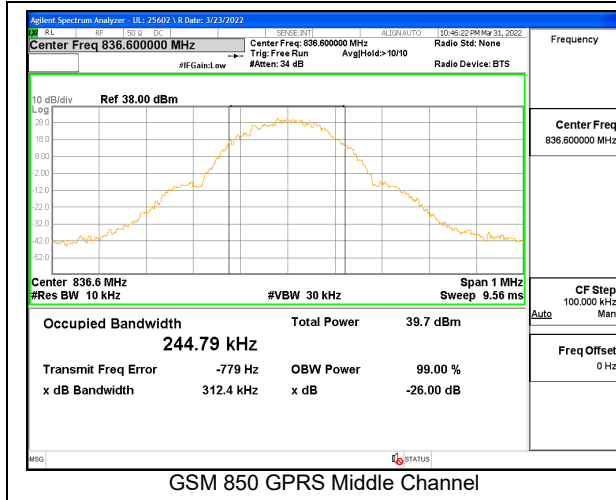
GSM

Band	Modulation	Channel	f(MHz)	99% BW (KHz)	-26dB BW (KHz)
850	GPRS	190	836.6	244.79	312.4
	EGPRS			238.73	304.5
1900	GPRS	661	1880.0	239.49	318.4
	EGPRS			243.74	304.4

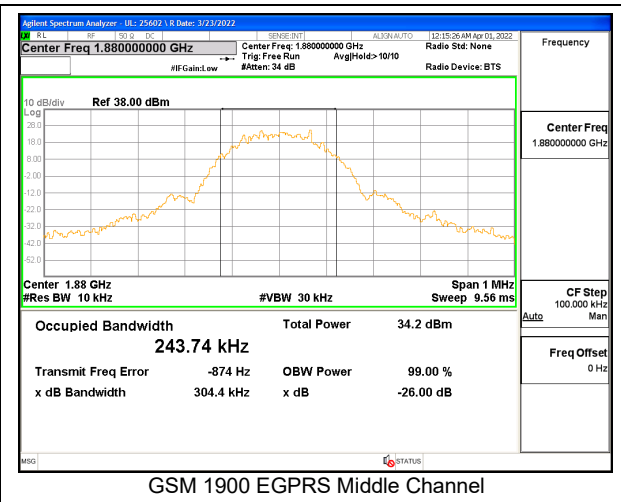
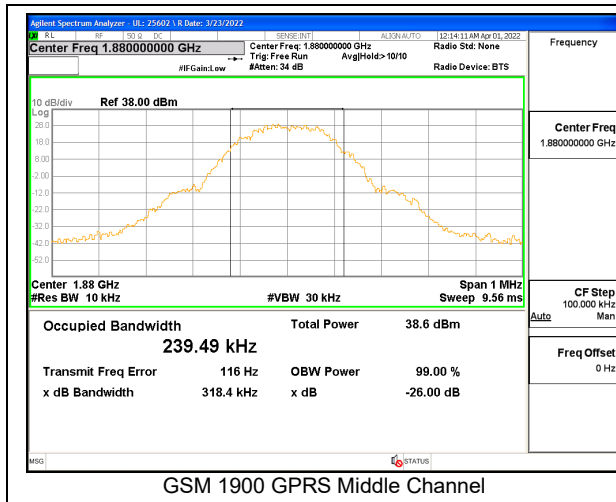
WCDMA

Band	Modulation	Channel	f(MHz)	99% BW (MHz)	-26dB BW (MHz)
BAND 5	REL 99	4408	836.6	4.1373	4.683
	HSDPA			4.1500	4.674
BAND 2	REL 99	9800	1880.0	4.1535	4.705
	HSDPA			4.1476	4.688
BAND 4	REL 99	1638	1732.6	4.1445	4.692
	HSDPA			4.1614	4.693

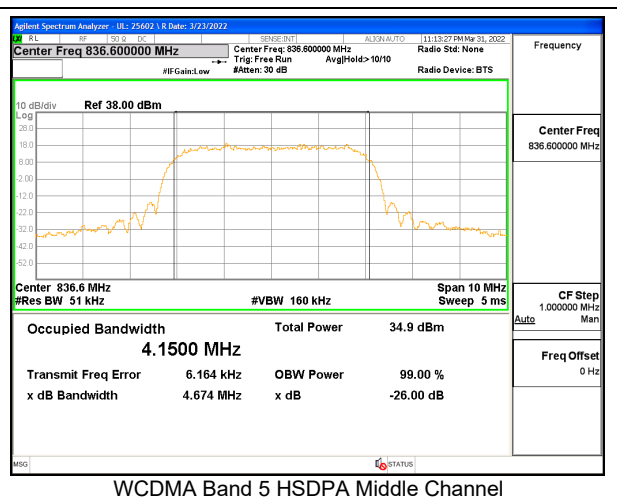
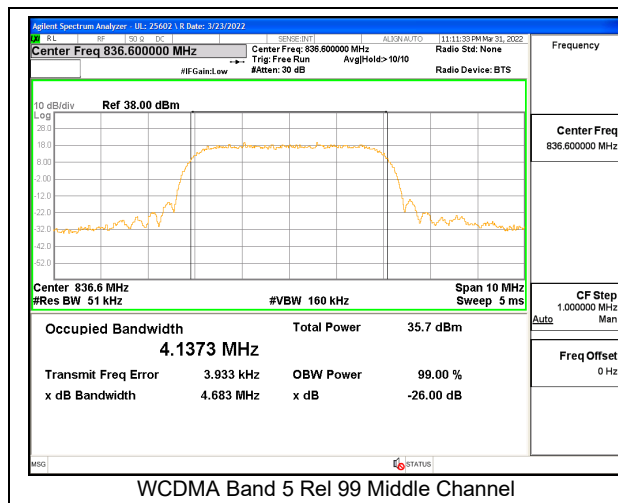
9.1.1. GSM 850



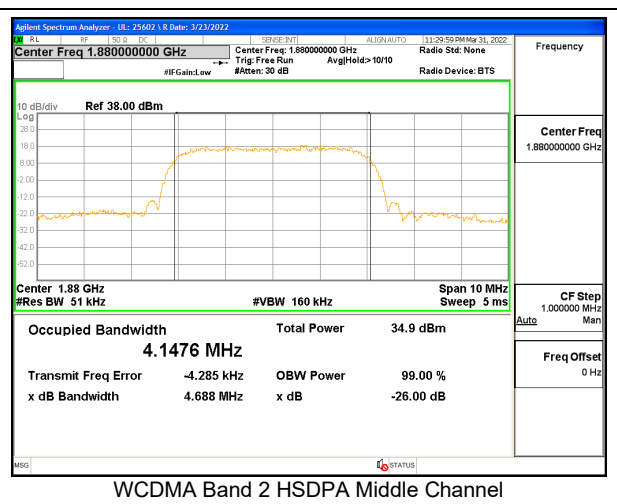
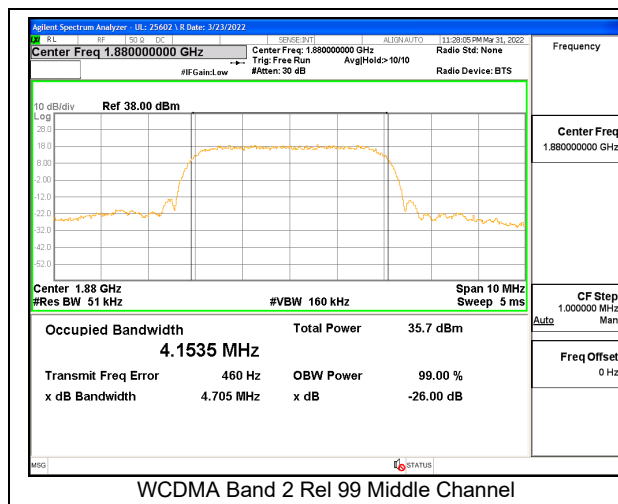
9.1.2. GSM 1900



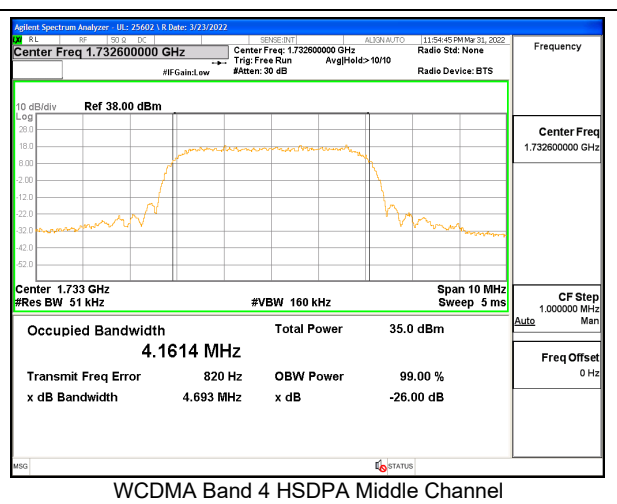
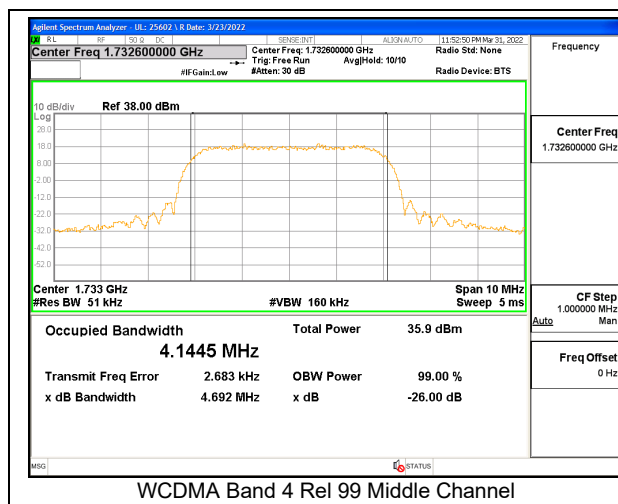
9.1.3. WCDMA BAND 5



9.1.4. WCDMA BAND 2



9.1.5. WCDMA BAND 4



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.

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 $43 + 10 \log_{10} p$ (watts).
- (ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

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 $43 + 10 \log_{10} p$ (watts).
- (ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

p is the output power specified in watts.

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 $43 + 10 \log_{10} p$ (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 $43 + 10 \log_{10} p$ (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, Footnote 2 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 least $43 + 10 \log_{10} p$ (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 $43 + 10 \log_{10} p$ (watts) dB.

TEST PROCEDURE

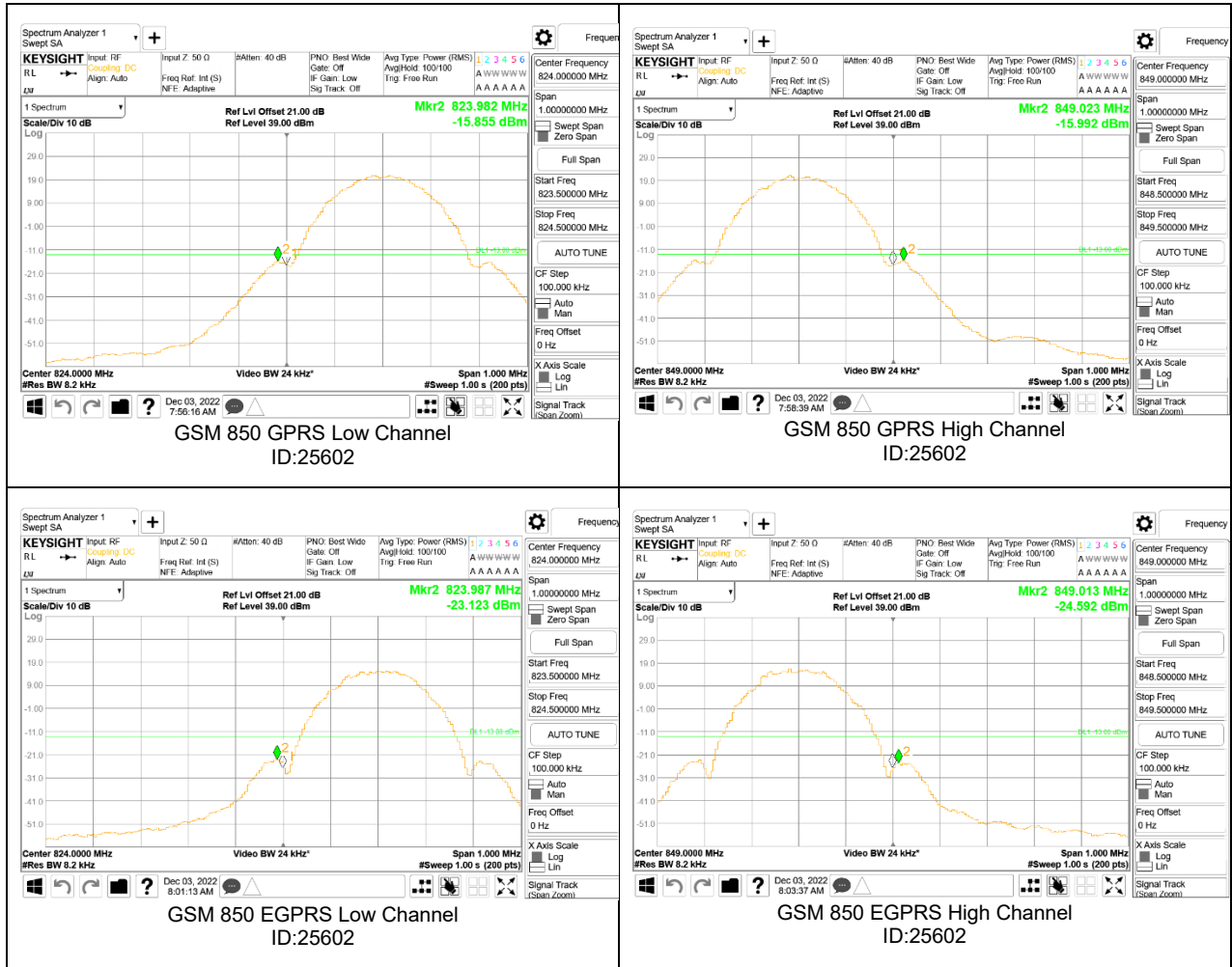
The transmitter output was connected to a R&S CMW500 Test Set and configured to operate at maximum power. The band edge emissions were measured at the required operating frequencies in each band on the Spectrum Analyzer.

For each band edge measurement:

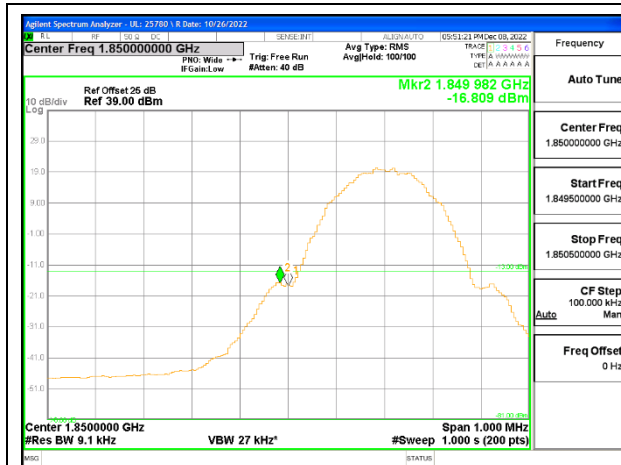
- Set the spectrum analyzer span to include the block edge frequency.
- Set a marker to point the corresponding band edge frequency in each test case.
- Set display line at -13 dBm
- Set resolution bandwidth to at least 1% of emission bandwidth.

RESULTS

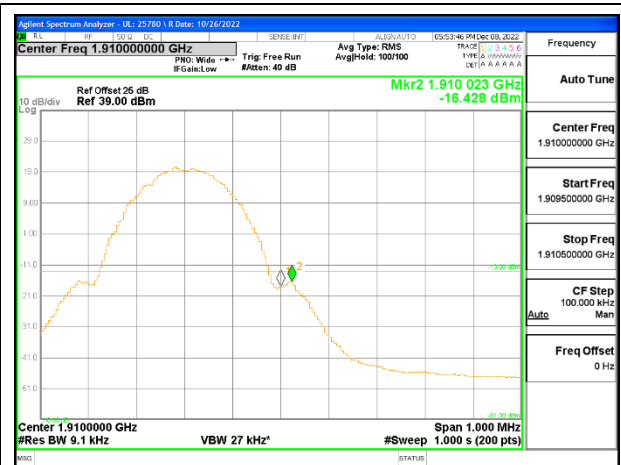
9.2.1. GSM 850



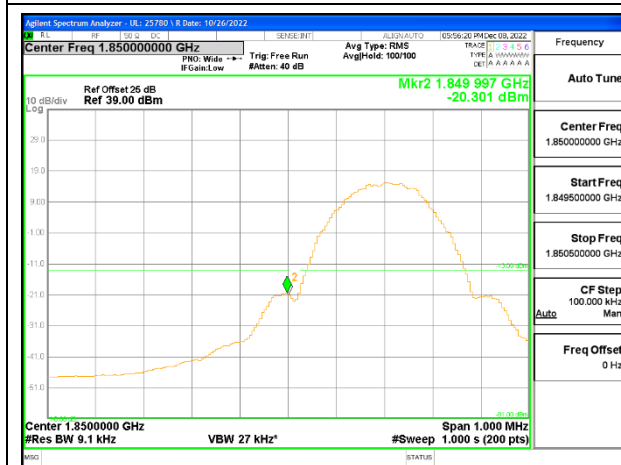
9.2.2. GSM 1900



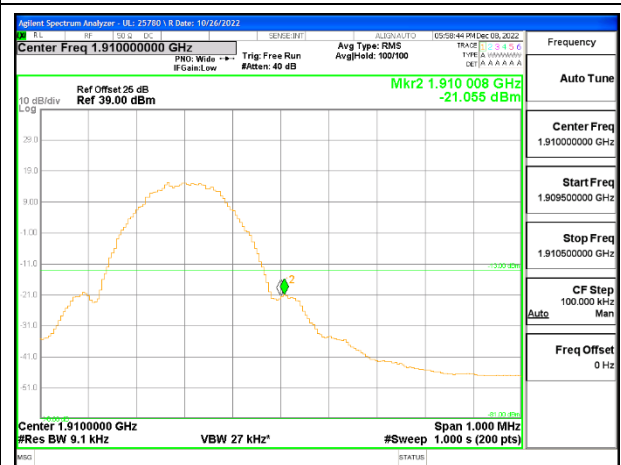
GSM 1900 GPRS Low Channel



GSM 1900 GPRS High Channel

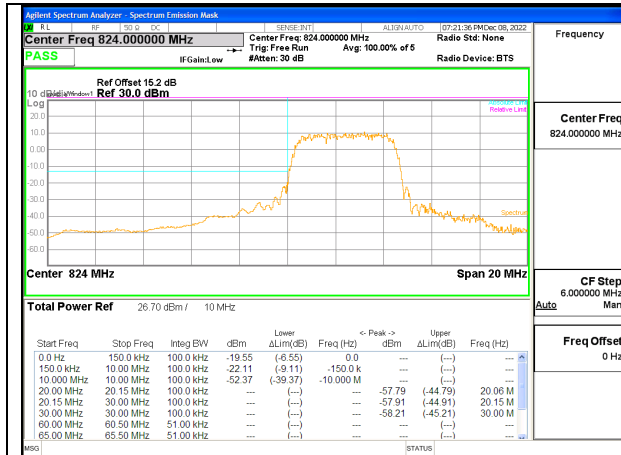


GSM 1900 EGPRS Low Channel

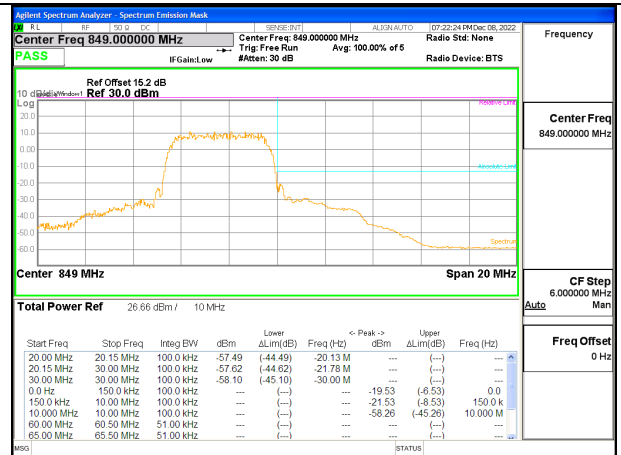


GSM 1900 EGPRS High Channel

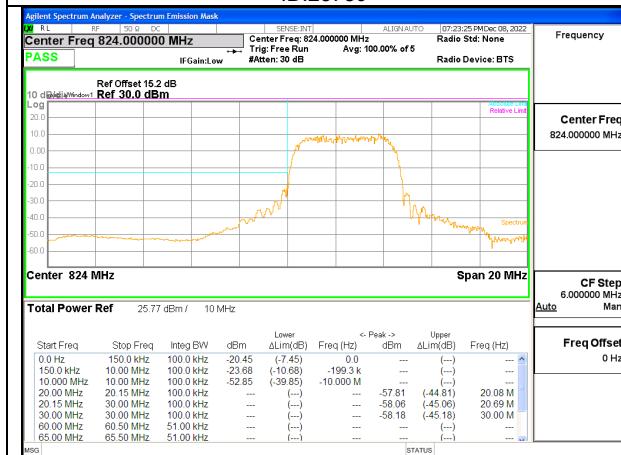
9.2.3. WCDMA BAND 5



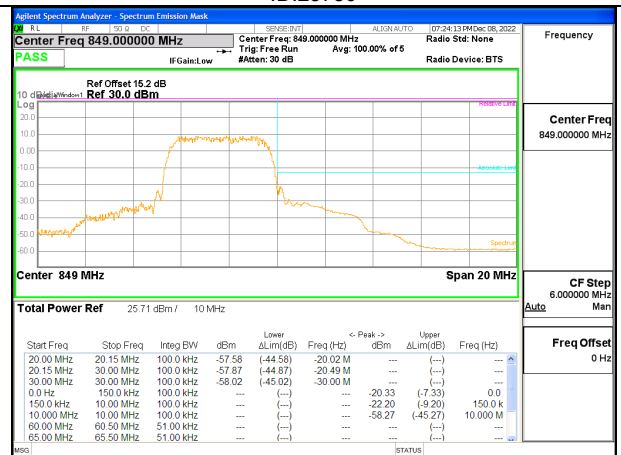
WCDMA Band 5 Rel 99 Low Channel ID:25780



WCDMA Band 5 Rel 99 High Channel ID:25780

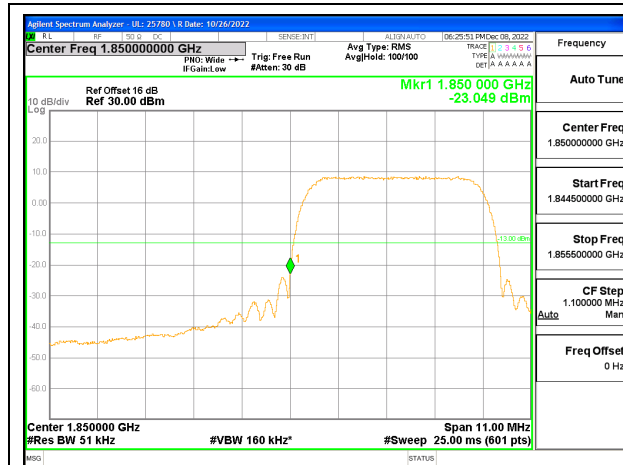


WCDMA Band 5 HSDPA Low Channel ID:25780

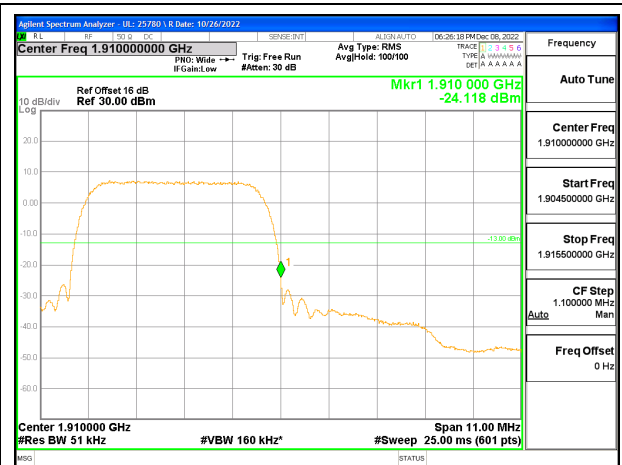


WCDMA Band 5 HSDPA High Channel ID:25780

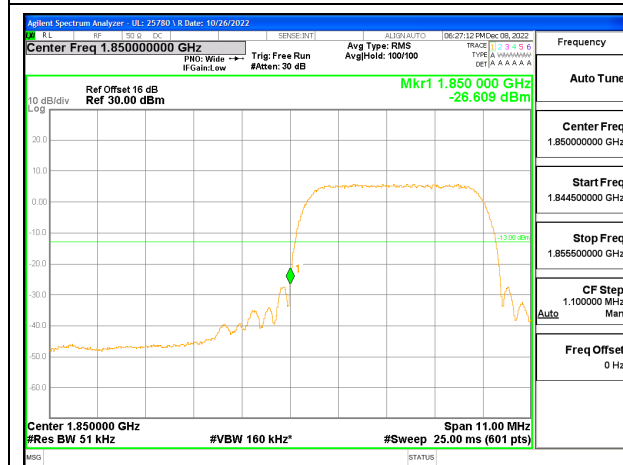
9.2.4. WCDMA BAND 2



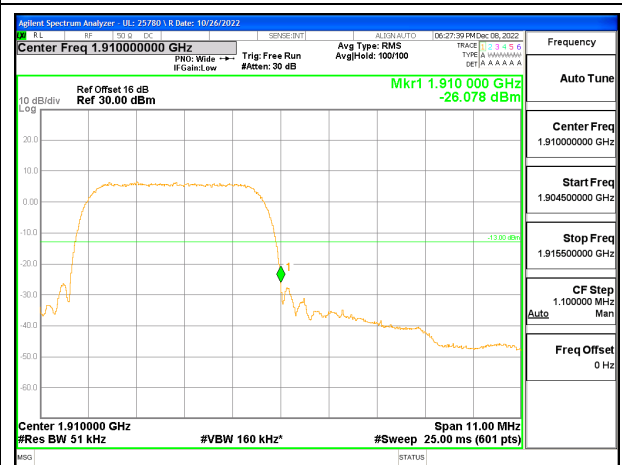
WCDMA Band 2 Rel 99 Low Channel



WCDMA Band 2 Rel 99 High Channel

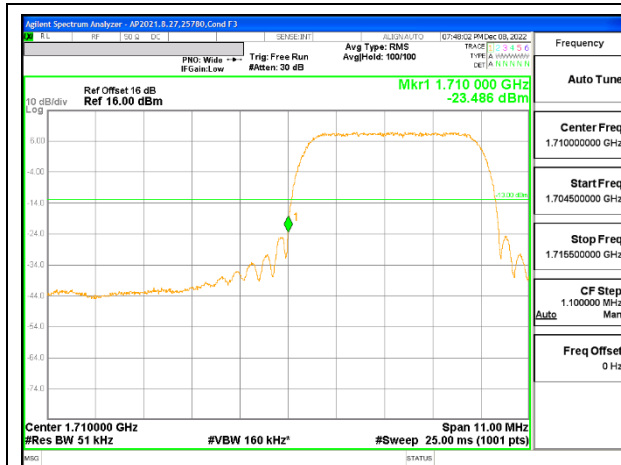


WCDMA Band 2 HSDPA Low Channel

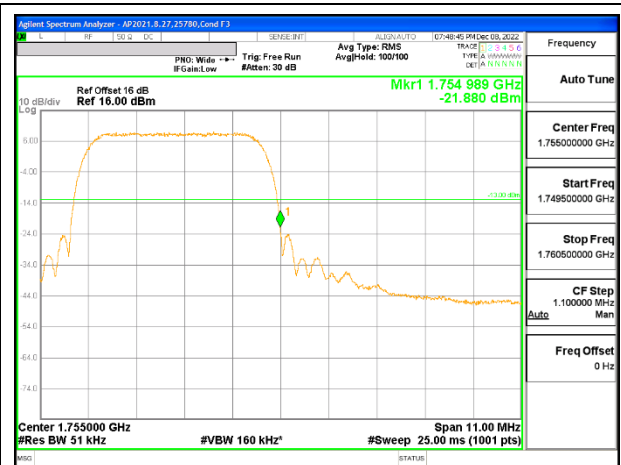


WCDMA Band 2 HSDPA High Channel

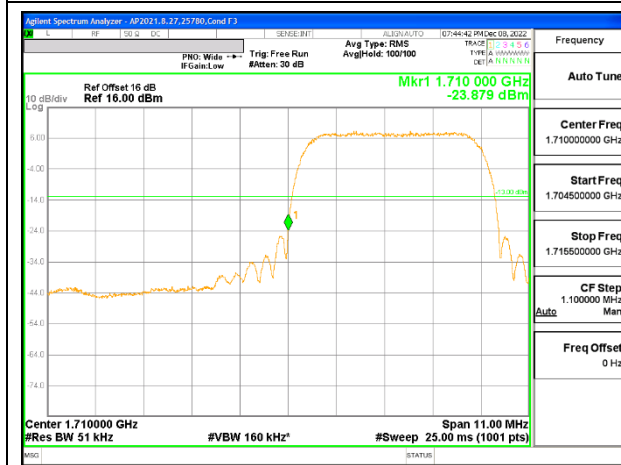
9.2.5. WCDMA BAND 4



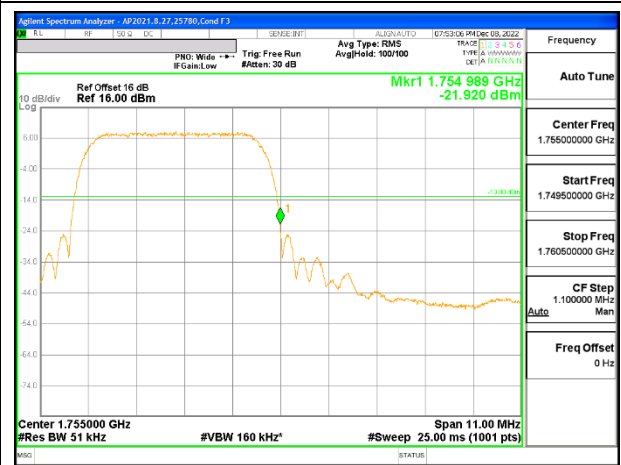
WCDMA Band 4 Rel 99 Low Channel



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

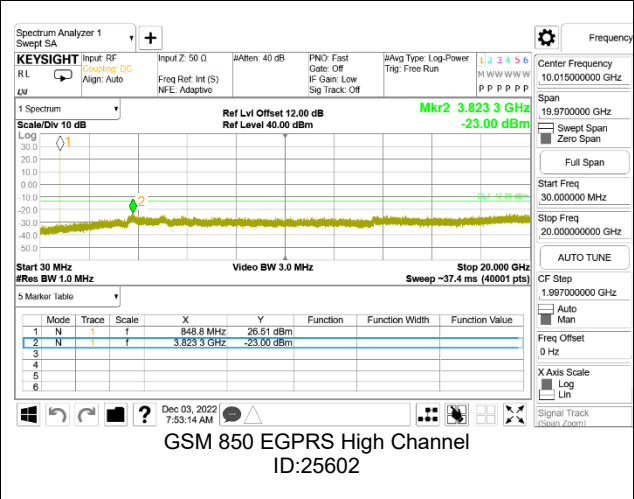
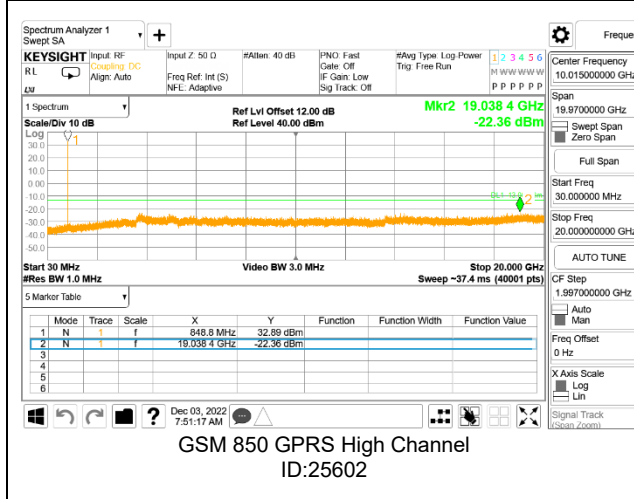
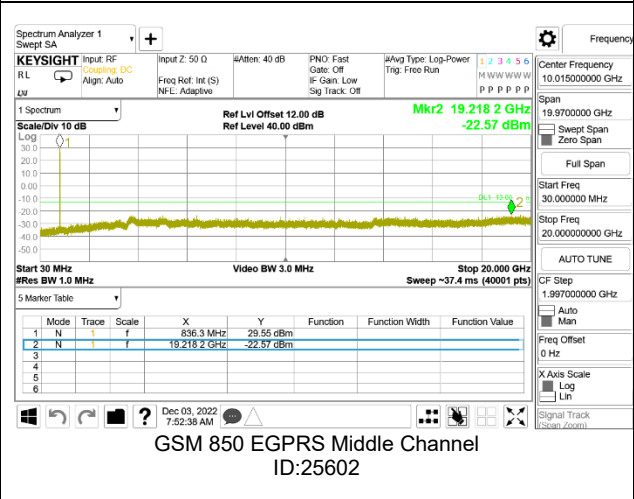
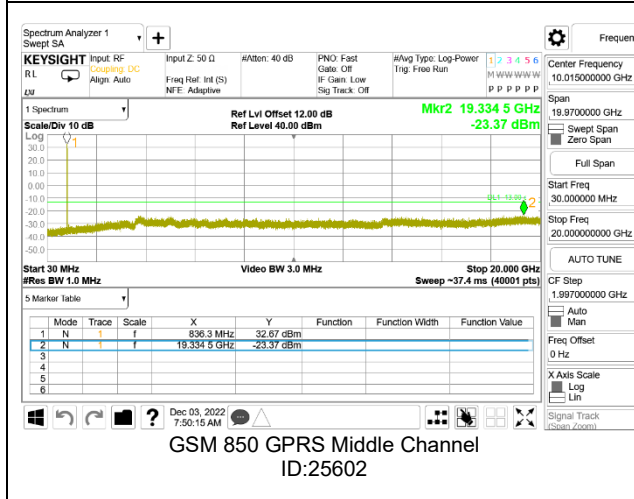
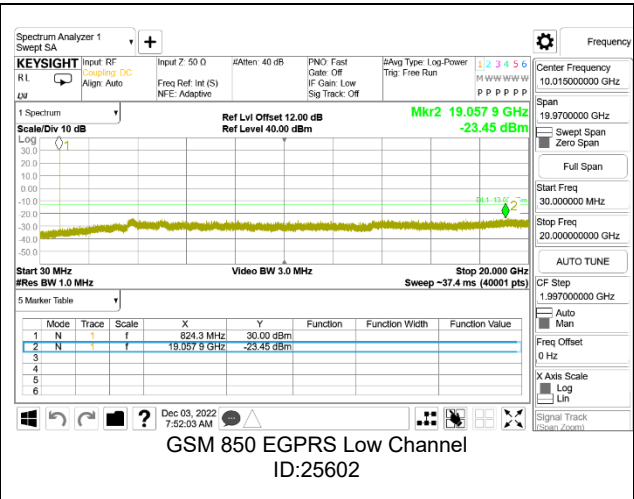
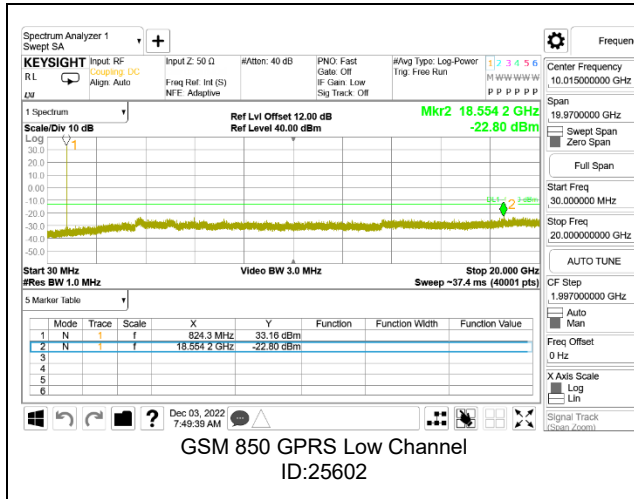
The RF output of the transmitter was connected to a spectrum analyzer through a calibrated coaxial cable. Sufficient scans were taken to show the out-of-band Emissions, if any, up to 10th harmonic. Multiple sweeps were recorded in maximum hold mode using a peak detector to ensure that the worst-case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

For each out of band emissions measurement:

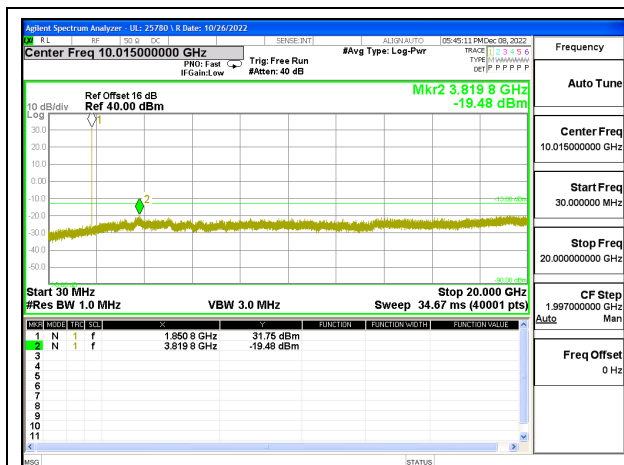
- Set display line at -13 dBm
- Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.
(NOTE: Worst case set RBW/VBW to 1MHz/3MHz)

RESULTS

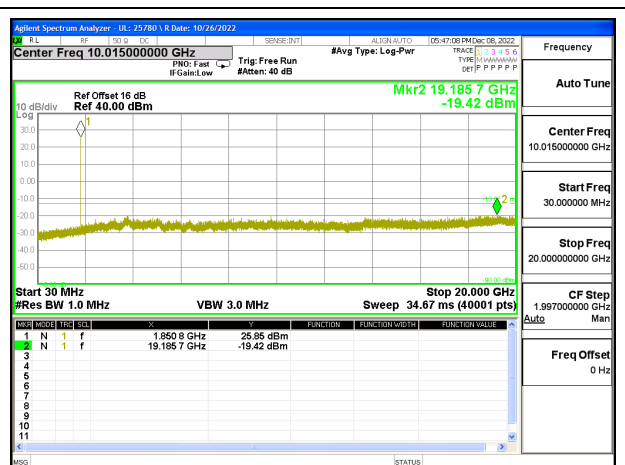
9.3.1. GSM 850



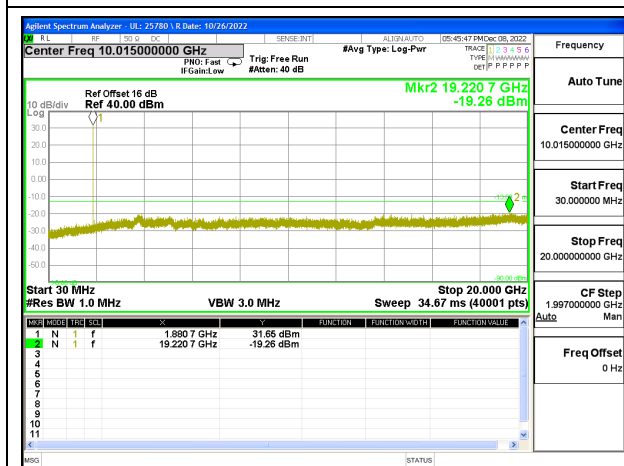
9.3.2. GSM 1900



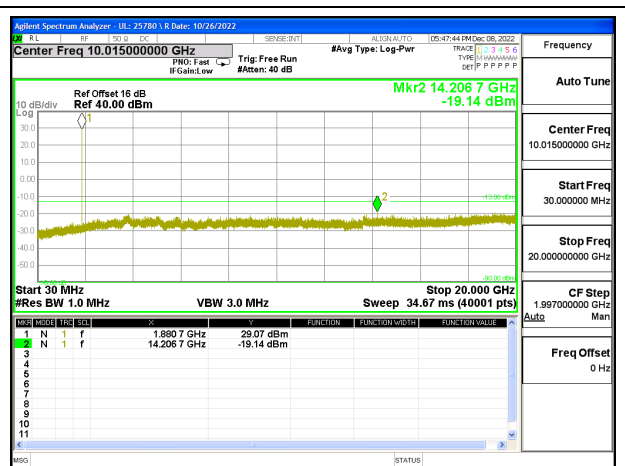
GSM 1900 GPRS Low Channel



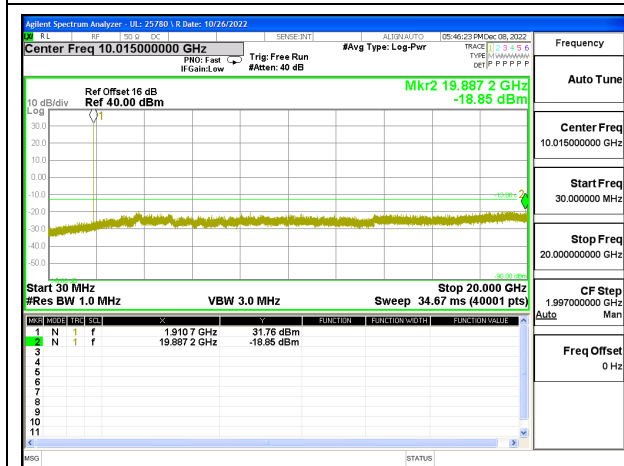
GSM 1900 EGPRS Low Channel



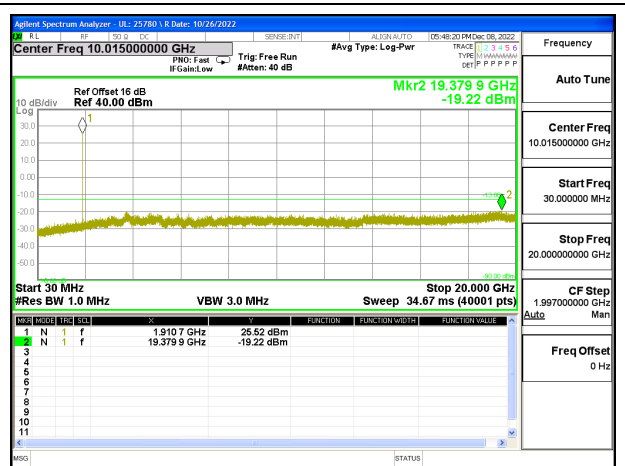
GSM 1900 GPRS Middle Channel



GSM 1900 EGPRS Middle Channel

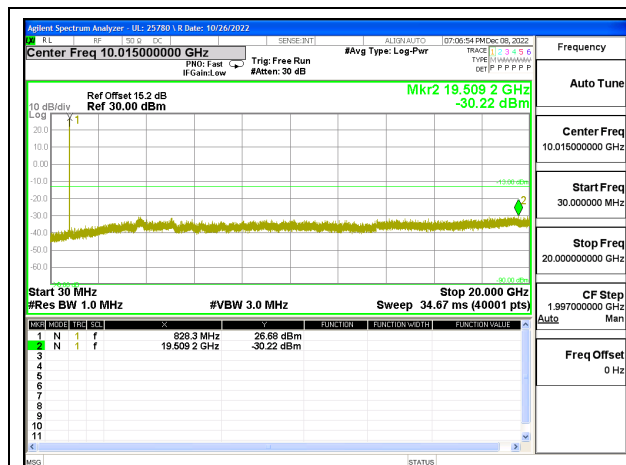


GSM 1900 GPRS High Channel

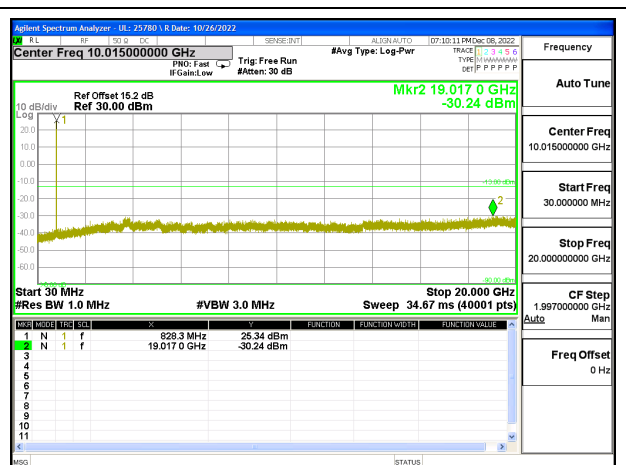


GSM 1900 EGPRS High Channel

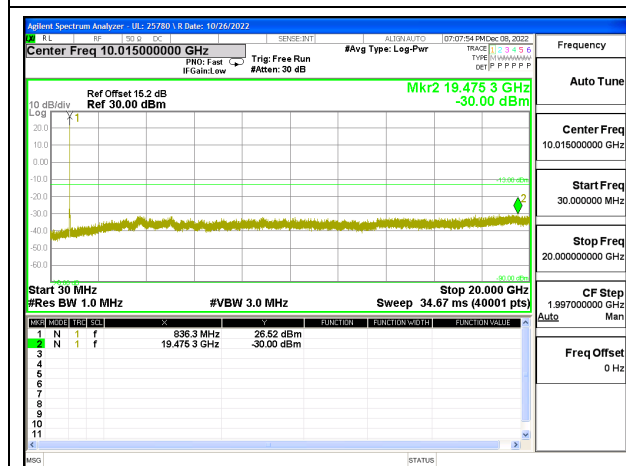
9.3.3. WCDMA BAND 5



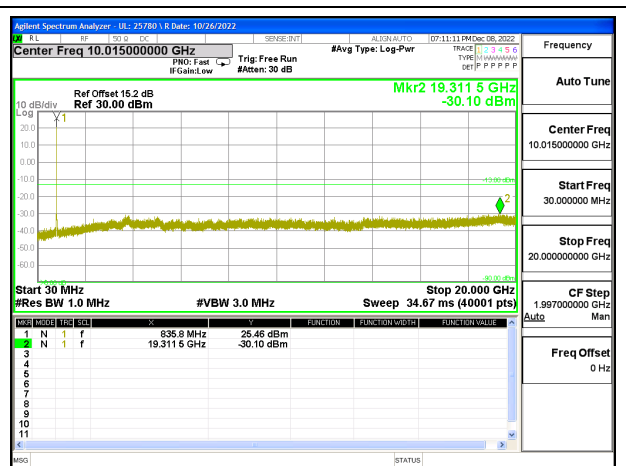
WCDMA Band 5 Rel 99 Low Channel



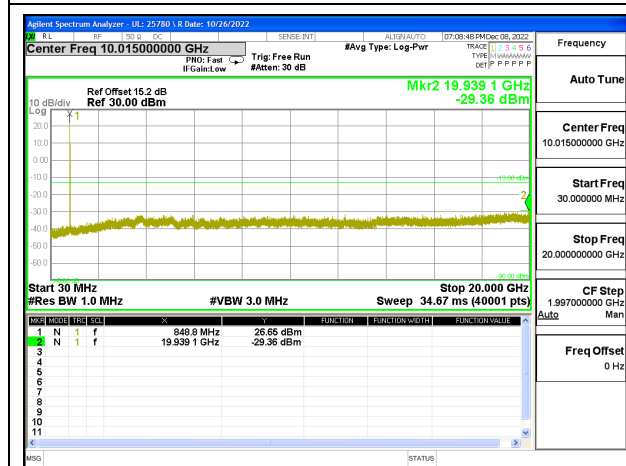
WCDMA Band 5 HSDPA Low Channel



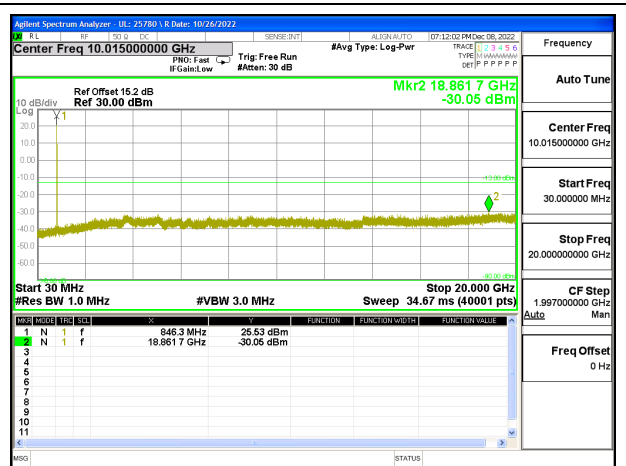
WCDMA Band 5 Rel 99 Middle Channel



WCDMA Band 5 HSDPA Middle Channel

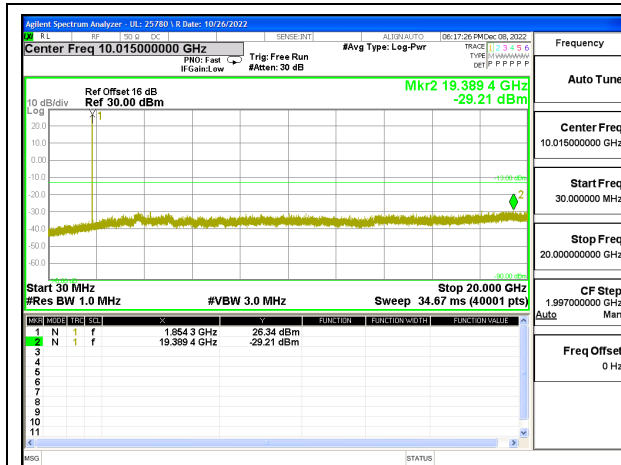


WCDMA Band 5 Rel 99 High Channel

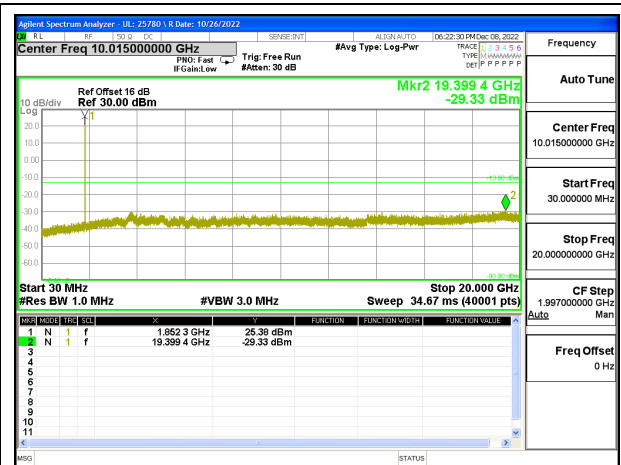


WCDMA Band 5 HSDPA High Channel

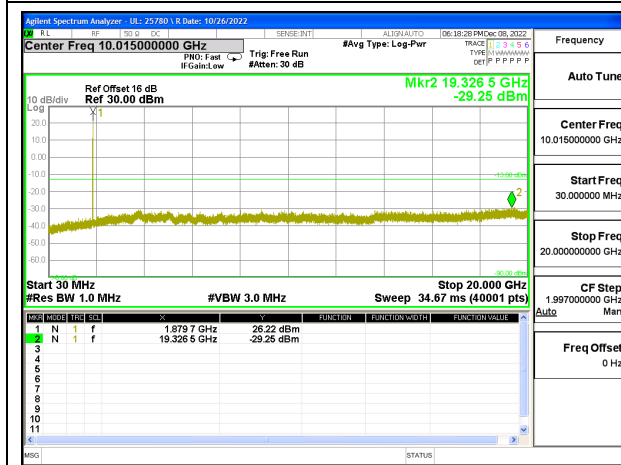
9.3.4. WCDMA BAND 2



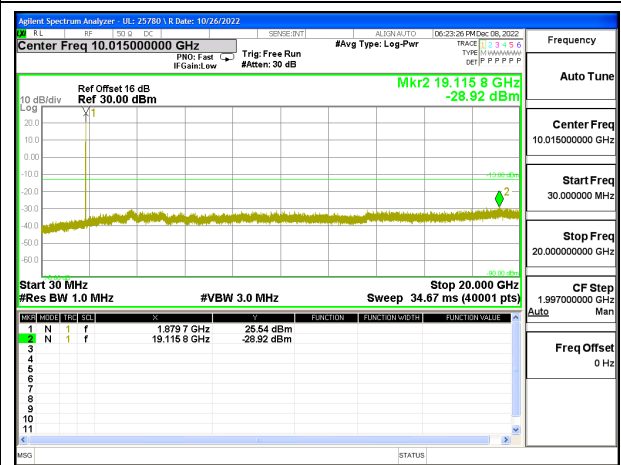
WCDMA Band 2 Rel 99 Low Channel



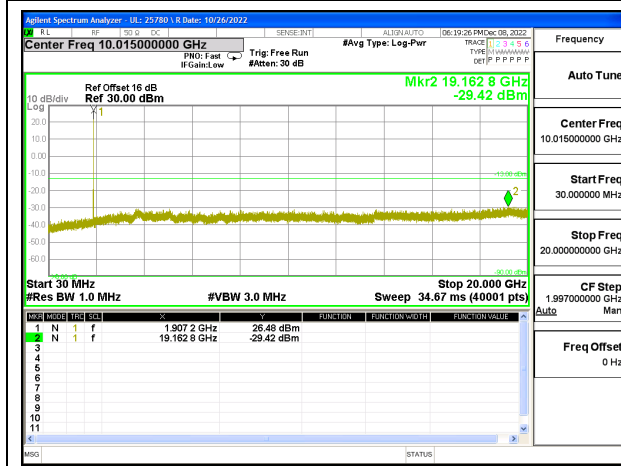
WCDMA Band 2 HSDPA Low Channel



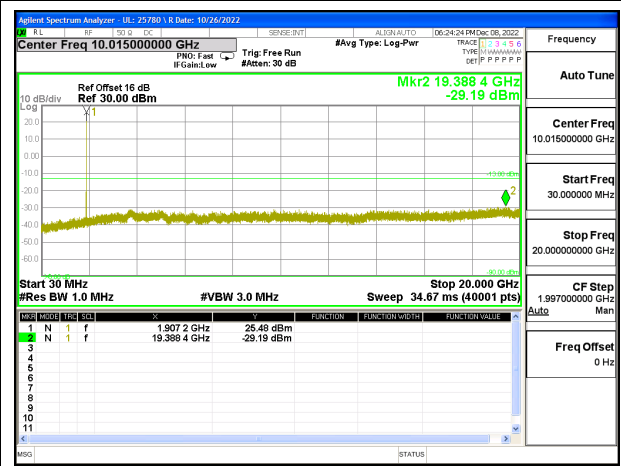
WCDMA Band 2 Rel 99 Middle Channel



WCDMA Band 2 HSDPA Middle Channel

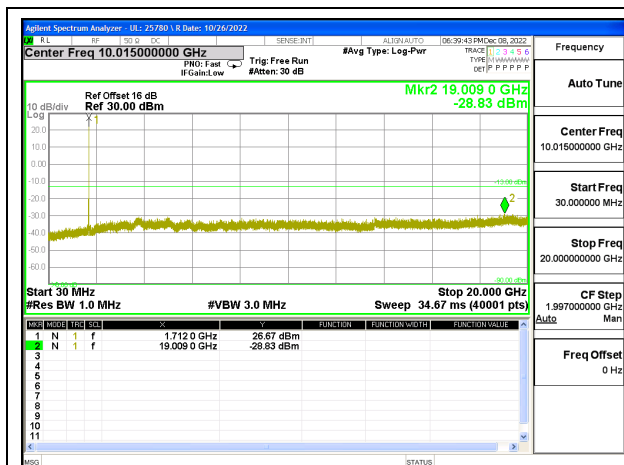


WCDMA Band 2 Rel 99 High Channel

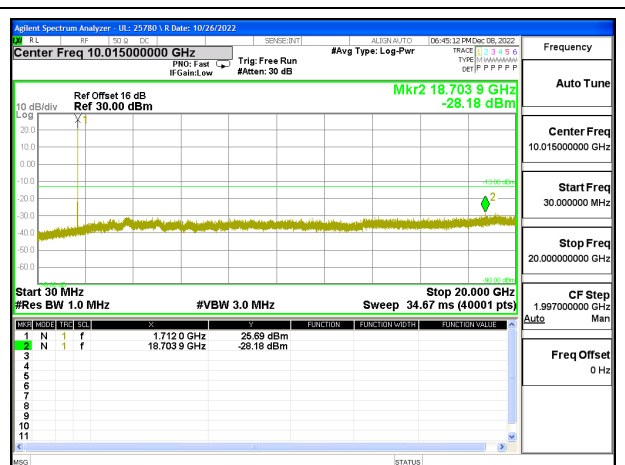


WCDMA Band 2 HSDPA High Channel

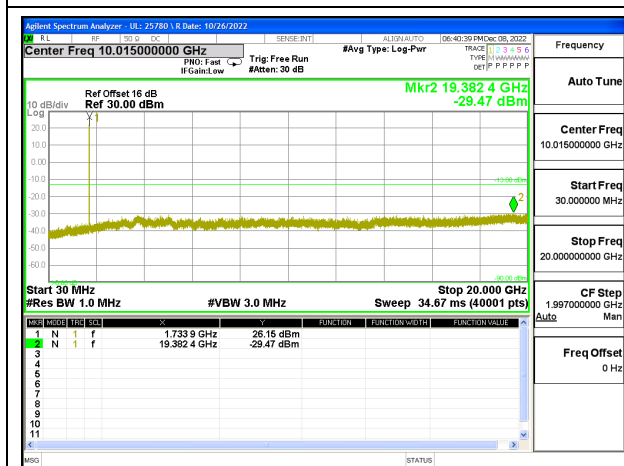
9.3.5. WCDMA BAND 4



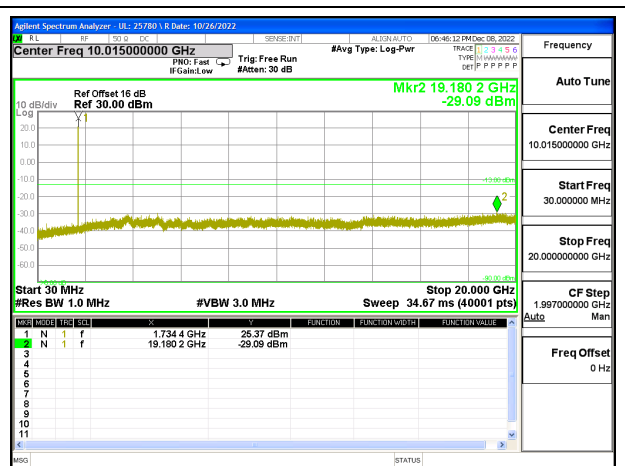
WCDMA Band 4 Rel 99 Low Channel



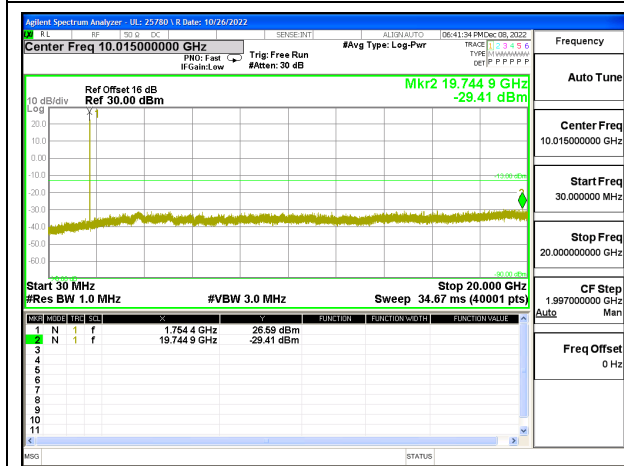
WCDMA Band 4 HSDPA Low Channel



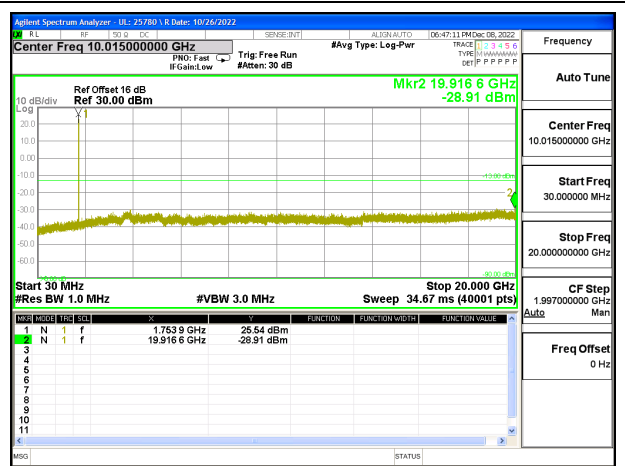
WCDMA Band 4 Rel 99 Middle Channel



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 §22.355

The carrier frequency shall not depart from the reference frequency in excess of ± 2.5 ppm for mobile stations.

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 $+50^{\circ}\text{C}$
- Voltage = (85% - 115%)
Low voltage, 3.23VDC, Normal, 3.8VDC and High voltage, 4.37VDC.
End Voltage, 2.95VDC.

Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to 20°C 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 $+50^{\circ}\text{C}$ is reached.

Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

RESULTS

See the following pages.

9.4.1. GSM 850

Test Engineer ID:	32061	Test Date:	1/20/2023
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Band		5		Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		824	849	2.5	Within Authorized Frequency Block (Hz)			
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)	Frequency Stability (ppm)				
Normal (20°C)	Normal	824.0230	848.9720					
Extreme (50°C)		824.0230	848.9720	24.4	0.029	Yes		
Extreme (40°C)		824.0230	848.9720	23.6	0.028	Yes		
Extreme (30°C)		824.0230	848.9720	24.7	0.029	Yes		
Extreme (10°C)		824.0230	848.9720	21.8	0.026	Yes		
Extreme (0°C)		824.0230	848.9720	26.5	0.032	Yes		
Extreme (-10°C)		824.0230	848.9720	23.2	0.028	Yes		
Extreme (-20°C)		824.0230	848.9720	25.4	0.030	Yes		
Extreme (-30°C)		824.0230	848.9720	25.5	0.031	Yes		
20°C	15%	824.0230	848.9720	22.0	0.026	Yes		
	-15%	824.0230	848.9720	22.9	0.027	Yes		
	End Point Voltage	824.0230	848.9720	23.7	0.028	Yes		

9.4.2. GSM 1900

Band	2	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1850	1910		2.5	Within Authorized Frequency Block (Hz)
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)		Frequency Stability (ppm)	
Normal (20°C)	Normal	1850.0470	1909.9570			
Extreme (50°C)		1850.0470	1909.9570	28.1	0.015	Yes
Extreme (40°C)		1850.0470	1909.9570	23.6	0.013	Yes
Extreme (30°C)		1850.0470	1909.9570	28.4	0.015	Yes
Extreme (10°C)		1850.0470	1909.9570	30.5	0.016	Yes
Extreme (0°C)		1850.0470	1909.9570	28.2	0.015	Yes
Extreme (-10°C)		1850.0470	1909.9570	25.0	0.013	Yes
Extreme (-20°C)		1850.0470	1909.9570	26.8	0.014	Yes
Extreme (-30°C)		1850.0470	1909.9570	29.6	0.016	Yes
20°C	15%	1850.0470	1909.9570	28.5	0.015	Yes
	-15%	1850.0470	1909.9570	28.4	0.015	Yes
	End Point Voltage	1850.0470	1909.9570	26.9	0.014	Yes

9.4.3. WCDMA BAND 5

Test Engineer ID:	32061	Test Date:	1/20/2023
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Band		5		Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		824	849	2.5	Within Authorized Frequency Block (Hz)			
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)	Frequency Stability (ppm)				
Normal (20°C)	Normal	824.0660	848.9340					
Extreme (50°C)		824.0660	848.9340	-3.4	-0.004	Yes		
Extreme (40°C)		824.0660	848.9340	-3.0	-0.004	Yes		
Extreme (30°C)		824.0660	848.9340	-3.0	-0.004	Yes		
Extreme (10°C)		824.0660	848.9340	3.4	0.004	Yes		
Extreme (0°C)		824.0660	848.9340	2.7	0.003	Yes		
Extreme (-10°C)		824.0660	848.9340	3.1	0.004	Yes		
Extreme (-20°C)		824.0660	848.9340	3.6	0.004	Yes		
Extreme (-30°C)		824.0660	848.9340	3.1	0.004	Yes		
20°C	15%	824.0660	848.9340	-3.2	-0.004	Yes		
	-15%	824.0660	848.9340	-3.5	-0.004	Yes		
	End Point Voltage	824.0660	848.9340	3.2	0.004	Yes		

9.4.4. WCDMA BAND 2

Band		2		Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1850	1910	2.5	Within Authorized Frequency Block (Hz)			
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)	Frequency Stability (ppm)				
Normal (20°C)	Normal	1850.0770	1909.9230					
Extreme (50°C)		1850.0770	1909.9230	6.6	0.004	Yes		
Extreme (40°C)		1850.0770	1909.9230	4.7	0.003	Yes		
Extreme (30°C)		1850.0770	1909.9230	4.8	0.003	Yes		
Extreme (10°C)		1850.0770	1909.9230	5.8	0.003	Yes		
Extreme (0°C)		1850.0770	1909.9230	6.9	0.004	Yes		
Extreme (-10°C)		1850.0770	1909.9230	8.5	0.005	Yes		
Extreme (-20°C)		1850.0770	1909.9230	8.3	0.004	Yes		
Extreme (-30°C)		1850.0770	1909.9230	8.7	0.005	Yes		
20°C	15%	1850.0770	1909.9230	5.3	0.003	Yes		
	-15%	1850.0770	1909.9230	4.6	0.002	Yes		
	End Point Voltage	1850.0770	1909.9230	4.6	0.002	Yes		

9.4.5. WCDMA BAND 4

Band	4	Frequency Range		Frequency Error Reading (Hz)	Limit	
Condition		1710	1755		Frequency Stability (ppm)	Within Authorized Frequency Block (Hz)
Temperature	Voltage	Freq Reading @ Low End (MHz)	Freq Reading @ High End (MHz)			
Normal (20°C)	Normal	1710.0770	1754.9340			
Extreme (50°C)		1710.0770	1754.9340	-6.6	-0.004	Yes
Extreme (40°C)		1710.0770	1754.9340	-7.1	-0.004	Yes
Extreme (30°C)		1710.0770	1754.9340	-8.1	-0.005	Yes
Extreme (10°C)		1710.0770	1754.9340	-7.7	-0.004	Yes
Extreme (0°C)		1710.0770	1754.9340	-6.2	-0.004	Yes
Extreme (-10°C)		1710.0770	1754.9340	-4.9	-0.003	Yes
Extreme (-20°C)		1710.0770	1754.9340	-4.5	-0.003	Yes
Extreme (-30°C)		1710.0770	1754.9340	-4.6	-0.003	Yes
20°C	15%	1710.0770	1754.9340	-8.4	-0.005	Yes
	-15%	1710.0770	1754.9340	-7.2	-0.004	Yes
	End Point Voltage	1710.0770	1754.9340	-7.4	-0.004	Yes

9.5. PEAK-TO-AVERAGE POWER RATIO

LIMIT

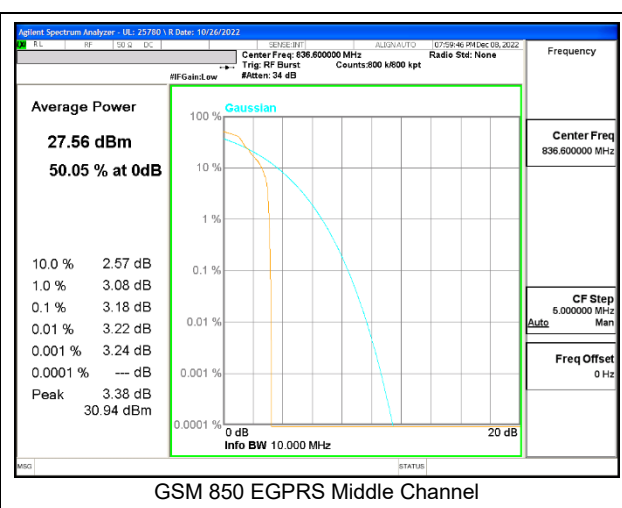
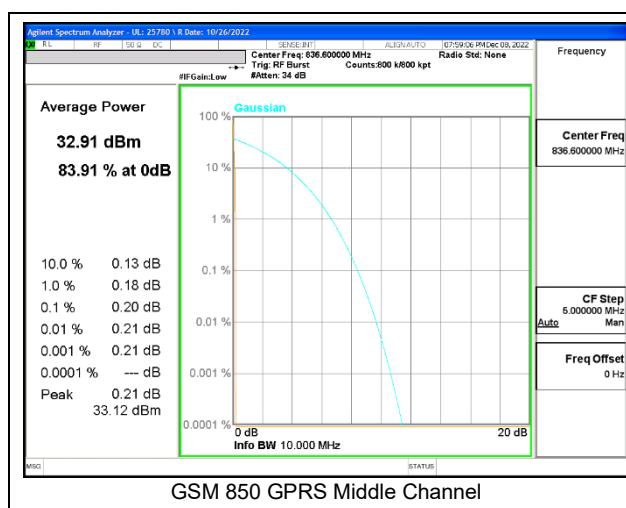
In addition, the peak-to-average power ratio (PAPR) of the transmitter shall not exceed 13 dB for more than 0.1% of the time and shall use a signal corresponding to the highest PAPR during periods of continuous transmission.

RESULT

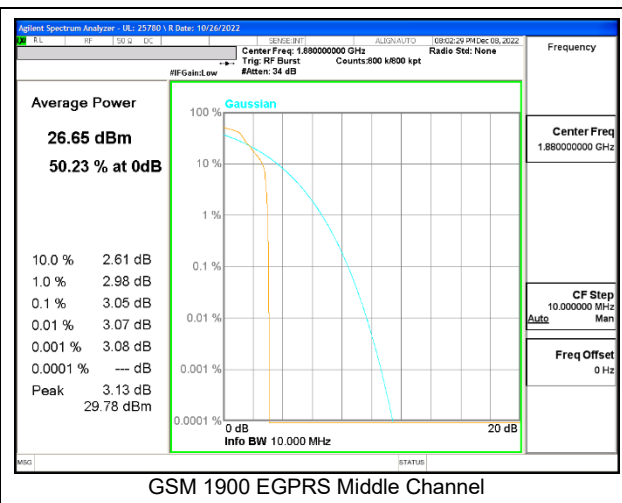
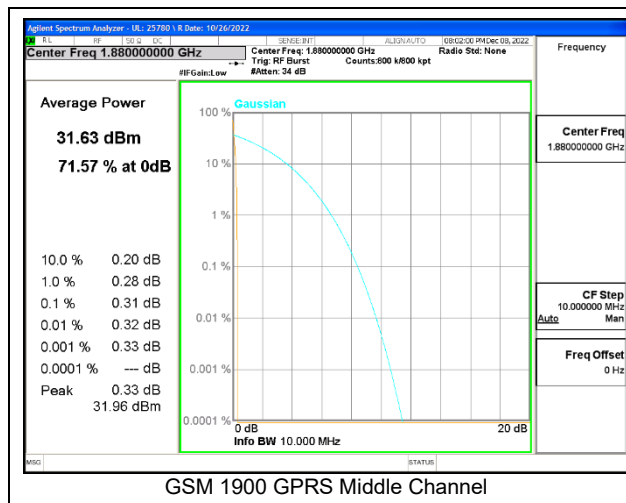
Ant 1 was used to measure as the worst case. The results from all CCDF plots are passed with 13dB peak-to-average power ratio criteria.

Test Engineer ID:	25602	Test Date:	3/23/2022
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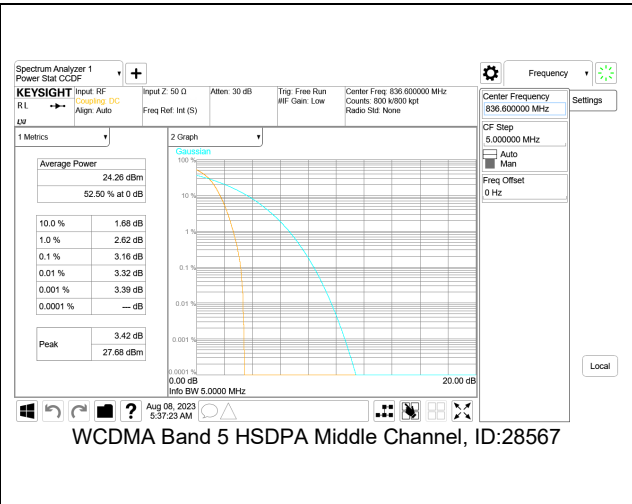
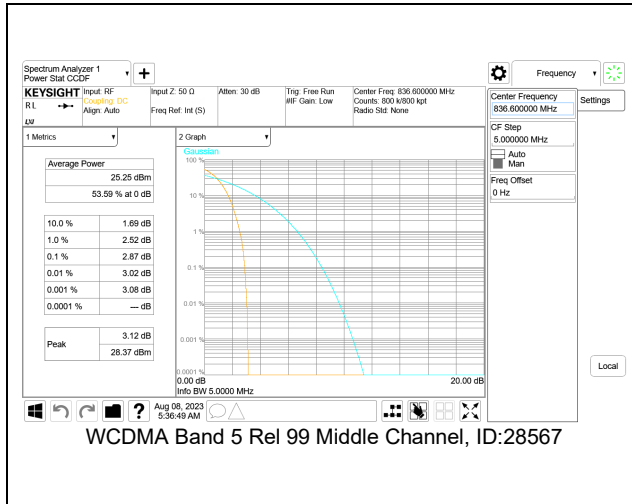
9.5.1. GSM 850



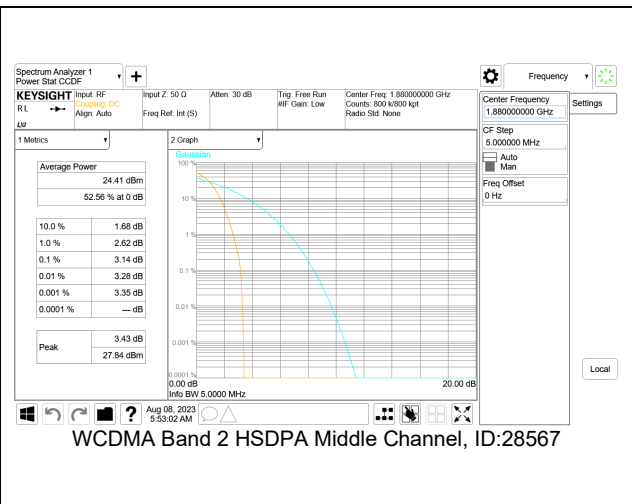
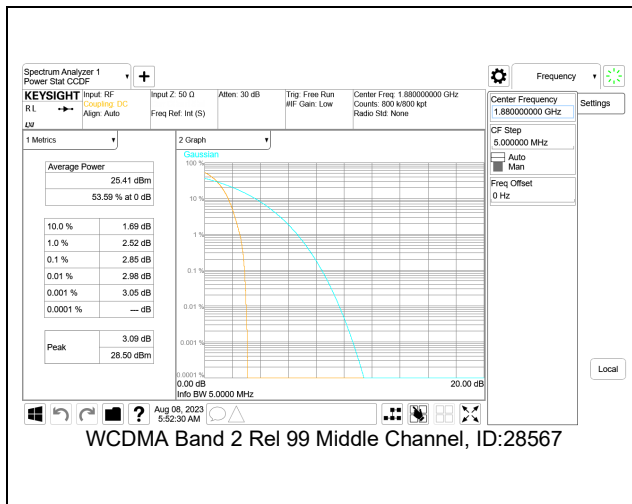
9.5.2. GSM 1900



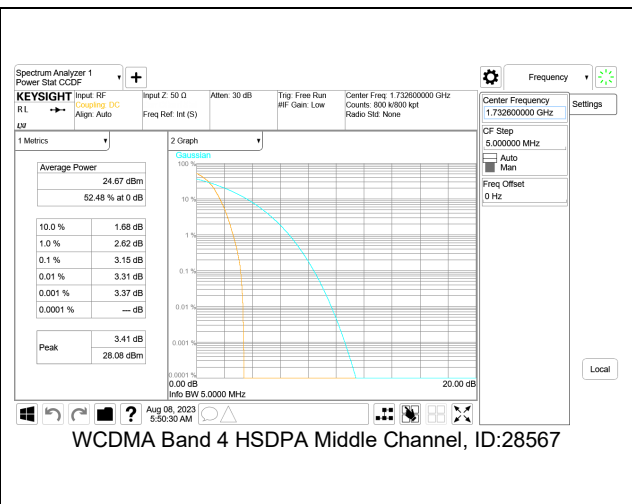
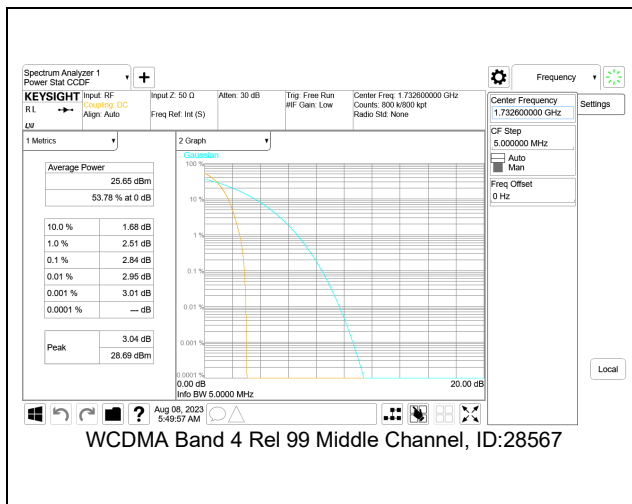
9.5.3. WCDMA BAND 5



9.5.4. WCDMA BAND 2



9.5.5. WCDMA BAND 4



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.

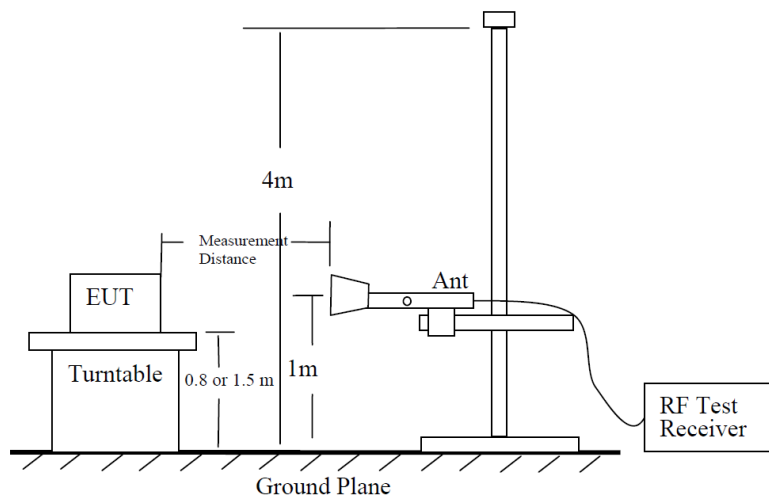


Figure 6—Test site-up for radiated ERP and/or EIRP measurements

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

- a) $E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dB}\mu\text{V)} + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$.
- b) $E \text{ (dB}\mu\text{V/m)} = \text{Measured amplitude level (dBm)} + 107 + \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$.
- c) $E \text{ (dB}\mu\text{V/m)} = \text{EIRP (dBm)} - 20\log(D) + 104.8$; where D is the measurement distance (in the far field region) in m.
- d) $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 20\log(D) - 104.8$; where D is the measurement distance (in the far field region) in m.

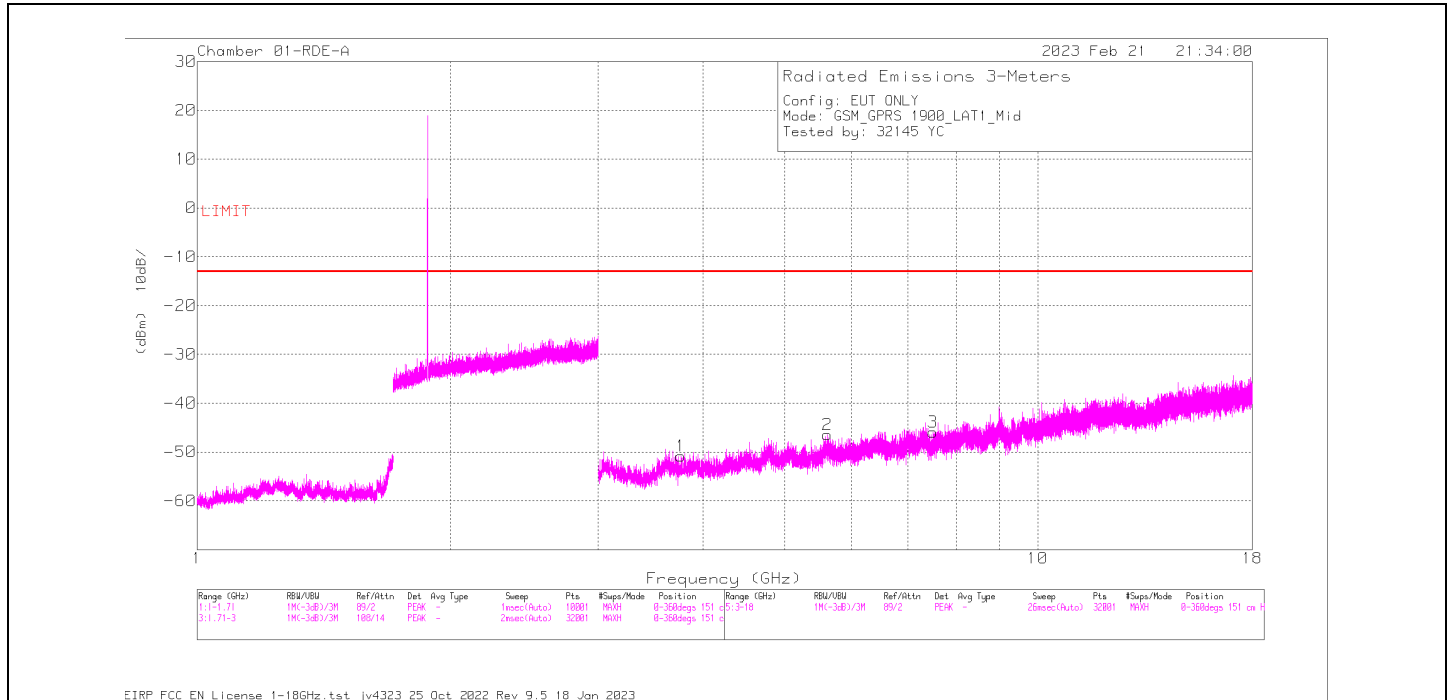
So, from d)

The measuring distance is usually at 3m, then $20 \cdot \log(3) = 9.5424$

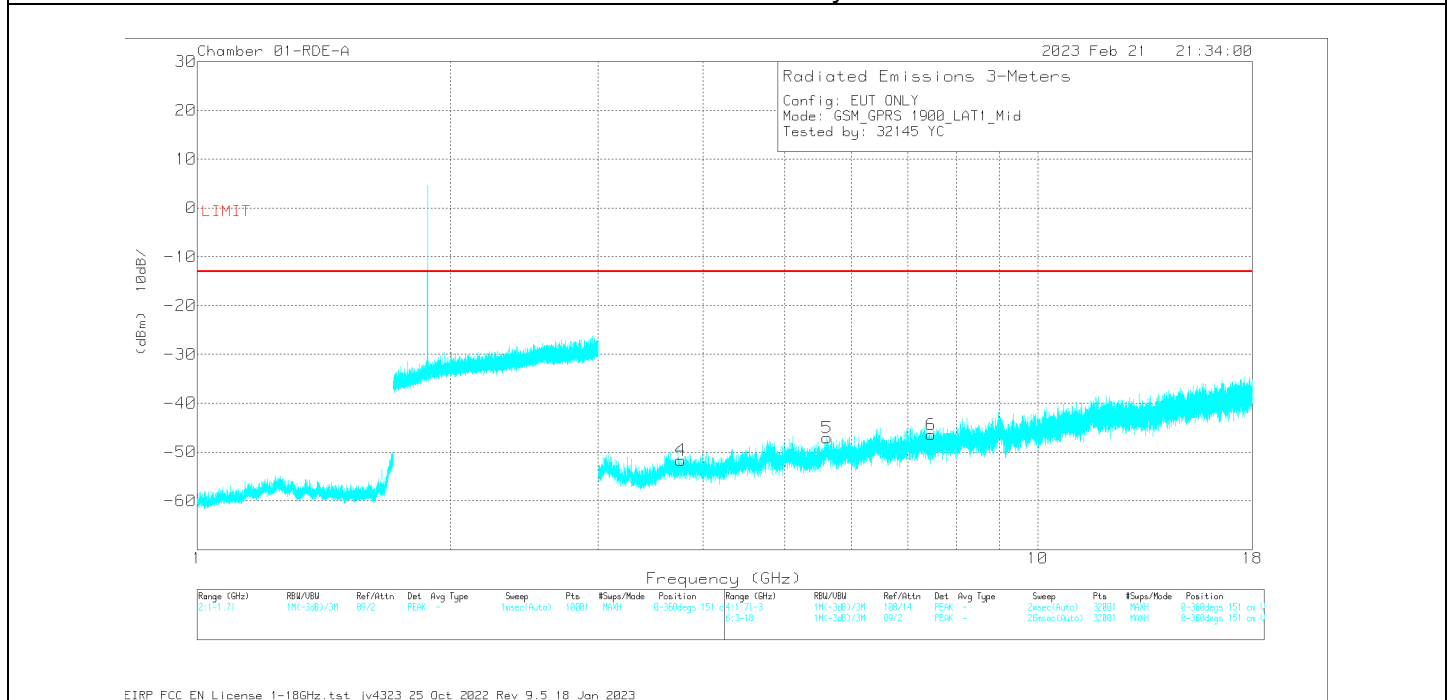
Then, $\text{EIRP (dBm)} = E \text{ (dB}\mu\text{V/m)} + 9.5424 - 104.8 = E \text{ (dB}\mu\text{V/m)} - 95.2576$

Note: Confidence check of each chamber is performed daily to see if any degradation from expected/normal reading reference data. Ambient check of each chamber is performed monthly.

Example Plot Above 1GHz



Horizontal Polarity



Vertical Polarity

Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
4	3.760313	35.49	Pk	32.9	-95.2	-24.87	-51.68	-13	-38.68	V
1	3.760781	36.33	Pk	32.9	-95.2	-24.88	-50.85	-13	-37.85	H
5	5.615156	34.06	Pk	34.7	-95.2	-20.66	-47.10	-13	-34.10	V
2	5.624063	34.65	Pk	34.7	-95.2	-20.59	-46.44	-13	-33.44	H
6	7.465313	32.27	Pk	35.5	-95.2	-19.02	-46.45	-13	-33.45	V
3	7.503281	32.64	Pk	35.5	-95.2	-18.9	-45.96	-13	-32.96	H

Pk - Peak detector

10.1. FIELD STRENGTH OF SPURIOUS RADIATION, ANT1

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 $43 + 10 \log_{10} p$ (watts).
- (ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least $43 + 10 \log_{10} p$ (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 $43 + 10 \log_{10} p$ (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 $43 + 10 \log_{10} p$ (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, Footnote 2 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 least $43 + 10 \log_{10} p$ (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 $43 + 10 \log_{10} p$ (watts) dB.

TEST PROCEDURE

KDB 971168 D01

RESULTS

10.1.1. GSM 850

GPRS MODE

Project #:	4790592262
Date:	2/23/2023
Test Engineer:	27761
Configuration:	EUT Only
Mode:	GPRS 850
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Polarity
Low Channel, 824.2 MHz										
1.649289	37.64	Pk	28.4	.8	-95.2	-29.06	-57.42	-13	-44.42	H
1.650756	37.29	Pk	28.4	.8	-95.2	-28.98	-57.69	-13	-44.69	V
2.474045	35.75	Pk	32.4	.5	-95.2	-27.56	-54.11	-13	-41.11	V
2.479423	36.82	Pk	32.3	.5	-95.2	-27.57	-53.15	-13	-40.15	H
3.287556	34.82	Pk	33.0	.9	-95.2	-26.04	-52.52	-13	-39.52	H
3.288534	34.73	Pk	32.9	.9	-95.2	-26.02	-52.69	-13	-39.69	V
Mid Channel, 836.6 MHz										
1.675200	37.47	Pk	28.6	.7	-95.2	-28.63	-57.06	-13	-44.06	H
1.681556	37.67	Pk	28.6	.7	-95.2	-28.61	-56.84	-13	-43.84	V
2.498000	35.38	Pk	32.2	.6	-95.2	-27.53	-54.55	-13	-41.55	V
2.507778	36.21	Pk	32.2	.7	-95.2	-27.51	-53.60	-13	-40.60	H
3.320312	36.23	Pk	32.6	.6	-95.2	-26.15	-51.92	-13	-38.92	V
3.339867	35.50	Pk	32.5	.5	-95.2	-26.25	-52.95	-13	-39.95	H
High Channel, 848.8 MHz										
1.706489	37.00	Pk	28.9	.6	-95.2	-28.78	-57.48	-13	-44.48	H
1.711867	37.42	Pk	29.0	.6	-95.2	-28.63	-56.81	-13	-43.81	V
2.557156	36.50	Pk	32.4	.5	-95.2	-27.11	-52.91	-13	-39.91	H
2.561067	36.02	Pk	32.4	.5	-95.2	-27.21	-53.49	-13	-40.49	V
3.400978	35.00	Pk	32.5	.6	-95.2	-25.77	-52.87	-13	-39.87	H
3.402445	35.26	Pk	32.5	.6	-95.2	-25.83	-52.67	-13	-39.67	V

EGPRS MODE

Project #:	4790592262
Date:	2/21/2023
Test Engineer:	32145
Configuration:	EUT Only
Mode:	EGPRS 850
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T136 (dB/m)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Amp/Cbl (dB)	Corrected Reading (dBm)	Limit	Margin (dB)	Polarity
Low Channel, 824.2 MHz										
1.639022	37.70	Pk	28.4	.7	-95.2	-28.83	-57.23	-13	-44.23	H
1.644400	37.89	Pk	28.5	.7	-95.2	-28.92	-57.03	-13	-44.03	V
2.465245	37.62	Pk	32.3	.5	-95.2	-27.66	-52.44	-13	-39.44	V
2.472089	36.52	Pk	32.4	.5	-95.2	-27.61	-53.39	-13	-40.39	H
3.283156	35.35	Pk	33.0	.8	-95.2	-25.94	-51.99	-13	-38.99	V
3.297823	36.25	Pk	32.8	.8	-95.2	-26.01	-51.36	-13	-38.36	H
Mid Channel, 836.6 MHz										
1.643422	37.06	Pk	28.5	.7	-95.2	-29.00	-57.94	-13	-44.94	V
1.658578	37.14	Pk	28.5	.8	-95.2	-28.93	-57.69	-13	-44.69	H
2.520000	35.77	Pk	32.2	.8	-95.2	-27.31	-53.74	-13	-40.74	H
2.526845	35.76	Pk	32.2	.8	-95.2	-27.31	-53.75	-13	-40.75	V
3.329112	35.03	Pk	32.6	.6	-95.2	-26.26	-53.23	-13	-40.23	V
3.344756	35.58	Pk	32.5	.5	-95.2	-26.29	-52.91	-13	-39.91	H
High Channel, 848.8 MHz										
1.669822	37.57	Pk	28.5	.7	-95.2	-28.86	-57.29	-13	-44.29	V
1.680089	37.13	Pk	28.6	.7	-95.2	-28.69	-57.46	-13	-44.46	H
2.542000	36.20	Pk	32.3	.7	-95.2	-27.25	-53.25	-13	-40.25	V
2.550800	36.00	Pk	32.4	.5	-95.2	-27.25	-53.55	-13	-40.55	H
3.395112	36.01	Pk	32.5	.6	-95.2	-25.91	-52.00	-13	-39.00	V
3.405378	34.97	Pk	32.5	.6	-95.2	-25.8	-52.93	-13	-39.93	H

10.1.2. GSM 1900

GPRS MODE

Project #:	4790592262
Date:	2/21/2023
Test Engineer:	32145
Configuration:	EUT Only
Mode:	GPRS 1900
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	EIRP CF	Amp/Cbl (dB)	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
3.673594	35.94	Pk	33.0	-95.2	-24.89	-51.15	-13	-38.15	V
3.690938	36.91	Pk	33.0	-95.2	-25.18	-50.47	-13	-37.47	H
5.547656	34.33	Pk	34.7	-95.2	-21.47	-47.64	-13	-34.64	V
5.55375	34.16	Pk	34.6	-95.2	-21.43	-47.87	-13	-34.87	H
7.362188	31.69	Pk	35.4	-95.2	-17.54	-45.65	-13	-32.65	V
7.384219	32.17	Pk	35.4	-95.2	-18.13	-45.76	-13	-32.76	H
Mid Channel, 1880MHz									
3.760313	35.49	Pk	32.9	-95.2	-24.87	-51.68	-13	-38.68	V
3.760781	36.33	Pk	32.9	-95.2	-24.88	-50.85	-13	-37.85	H
5.615156	34.06	Pk	34.7	-95.2	-20.66	-47.10	-13	-34.10	V
5.624063	34.65	Pk	34.7	-95.2	-20.59	-46.44	-13	-33.44	H
7.465313	32.27	Pk	35.5	-95.2	-19.02	-46.45	-13	-33.45	V
7.503281	32.64	Pk	35.5	-95.2	-18.90	-45.96	-13	-32.96	H
High Channel, 1909.8MHz									
3.840469	36.98	Pk	32.9	-95.2	-24.81	-50.13	-13	-37.13	H
3.842344	36.99	Pk	32.9	-95.2	-24.8	-50.11	-13	-37.11	V
5.728125	34.39	Pk	34.8	-95.2	-21.7	-47.71	-13	-34.71	H
5.733281	34.36	Pk	34.8	-95.2	-21.74	-47.78	-13	-34.78	V
7.646719	32.38	Pk	35.6	-95.2	-17.7	-44.92	-13	-31.92	V
7.661719	33.20	Pk	35.5	-95.2	-17.97	-44.47	-13	-31.47	H

EGPRS MODE

Project #:	4790592262
Date:	2/24/2023
Test Engineer:	32145
Configuration:	EUT Only
Mode:	EGPRS 1900
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T862 (dB/m)	EIRP CF	Amp/Cbl (dB)	Corrected Reading (dBm)	Harmonics limit	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
3.680156	36.71	Pk	32.9	-95.2	-24.95	-50.54	-13	-37.54	V
3.704063	36.95	Pk	33.0	-95.2	-25.08	-50.33	-13	-37.33	H
5.550938	34.38	Pk	34.6	-95.2	-21.44	-47.66	-13	-34.66	V
5.569688	33.97	Pk	34.7	-95.2	-21.21	-47.74	-13	-34.74	H
7.428281	34.02	Pk	35.4	-95.2	-18.75	-44.53	-13	-31.53	H
7.431563	32.04	Pk	35.4	-95.2	-18.77	-46.53	-13	-33.53	V
Mid Channel, 1880MHz									
3.774844	35.57	Pk	33.0	-95.2	-24.91	-51.54	-13	-38.54	V
3.783281	36.09	Pk	33.0	-95.2	-24.93	-51.04	-13	-38.04	H
5.633906	33.56	Pk	34.7	-95.2	-20.60	-47.54	-13	-34.54	V
5.650313	35.21	Pk	34.6	-95.2	-20.72	-46.11	-13	-33.11	H
7.510313	32.05	Pk	35.4	-95.2	-18.85	-46.60	-13	-33.60	V
7.531406	32.9	Pk	35.5	-95.2	-18.47	-45.27	-13	-32.27	H
High Channel, 1909.8MHz									
3.787031	35.71	Pk	33.0	-95.2	-25.03	-51.52	-13	-38.52	V
3.795469	36.27	Pk	33.1	-95.2	-25.04	-50.87	-13	-37.87	H
5.730938	33.66	Pk	34.8	-95.2	-21.69	-48.43	-13	-35.43	V
5.736094	33.74	Pk	34.8	-95.2	-21.73	-48.39	-13	-35.39	H
7.605000	31.93	Pk	35.5	-95.2	-17.69	-45.46	-13	-32.46	V
7.618594	32.88	Pk	35.5	-95.2	-17.84	-44.66	-13	-31.66	H

10.1.2.1. WCDMA BAND 5

REL 99 MODE

Project #:	4790592262
Date:	02/23/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	REL 99 Band 5
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 826.4MHz										
1.652711	36.21	Pk	28.4	.8	-95.2	-28.89	-58.68	-13	-45.68	H
1.652711	36.7	Pk	28.4	.8	-95.2	-28.89	-58.19	-13	-45.19	V
2.479286	37.92	Pk	32.3	.5	-95.2	-27.57	-52.05	-13	-39.05	H
2.478934	35.59	Pk	32.3	.5	-95.2	-27.56	-54.37	-13	-41.37	V
3.305156	35.44	Pk	32.7	.7	-95.2	-26.06	-52.42	-13	-39.42	H
3.305156	35.12	Pk	32.7	.7	-95.2	-26.06	-52.74	-13	-39.74	V
Mid Channel, 836.6MHz										
1.773467	34.69	Pk	29.8	.6	-95.2	-28.77	-58.88	-13	-45.88	H
1.773467	36.55	Pk	29.8	.6	-95.2	-28.77	-57.02	-13	-44.02	V
2.50739	42.21	Pk	32.2	.7	-95.2	-27.49	-47.58	-13	-34.58	H
2.512178	36.69	Pk	32.2	.7	-95.2	-27.42	-53.03	-13	-40.03	V
3.347200	34.38	Pk	32.5	.5	-95.2	-26.21	-54.03	-13	-41.03	H
3.347200	35.91	Pk	32.5	.5	-95.2	-26.21	-52.50	-13	-39.50	V
High Channel, 846.6MHz										
1.694267	35.34	Pk	28.8	.7	-95.2	-28.81	-59.17	-13	-46.17	H
1.694267	36.53	Pk	28.8	.7	-95.2	-28.81	-57.98	-13	-44.98	V
2.536115	43.96	Pk	32.2	.7	-95.2	-27.36	-45.70	-13	-32.70	H
2.536623	36.26	Pk	32.2	.7	-95.2	-27.38	-53.42	-13	-40.42	V
3.386312	34.29	Pk	32.4	.6	-95.2	-26.00	-53.91	-13	-40.91	V
3.388756	34.22	Pk	32.4	.6	-95.2	-26.08	-54.06	-13	-41.06	H

HSDPA MODE

Project #:	4790592262
Date:	02/23/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	HSDPA Band 5
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 826.4MHz										
1.650267	37.00	Pk	28.4	.8	-95.2	-29.01	-58.01	-13	-45.01	H
1.650756	36.12	Pk	28.4	.8	-95.2	-28.98	-58.86	-13	-45.86	V
2.482356	37.53	Pk	32.3	.5	-95.2	-27.54	-52.41	-13	-39.41	H
2.482356	33.86	Pk	32.3	.5	-95.2	-27.54	-56.08	-13	-43.08	V
3.304667	35.38	Pk	32.7	.7	-95.2	-26.07	-52.49	-13	-39.49	H
3.304667	34.82	Pk	32.7	.7	-95.2	-26.07	-53.05	-13	-40.05	V
Mid Channel, 836.6MHz										
1.671289	37.27	Pk	28.6	.7	-95.2	-28.85	-57.48	-13	-44.48	H
1.672267	35.72	Pk	28.6	.7	-95.2	-28.81	-58.99	-13	-45.99	V
2.510711	36.90	Pk	32.2	.7	-95.2	-27.49	-52.89	-13	-39.89	V
2.512916	38.26	Pk	32.2	.7	-95.2	-27.40	-51.44	-13	-38.44	H
3.345734	34.19	Pk	32.5	.5	-95.2	-26.27	-54.28	-13	-41.28	V
3.346223	33.50	Pk	32.5	.5	-95.2	-26.25	-54.95	-13	-41.95	H
High Channel, 846.6MHz										
1.691822	35.99	Pk	28.8	.7	-95.2	-28.84	-58.55	-13	-45.55	H
1.693289	35.94	Pk	28.8	.7	-95.2	-28.87	-58.63	-13	-45.63	V
2.536103	40.47	Pk	32.2	.7	-95.2	-27.36	-49.19	-13	-36.19	H
2.538089	36.08	Pk	32.2	.7	-95.2	-27.42	-53.64	-13	-40.64	V
3.386801	34.68	Pk	32.4	.6	-95.2	-26.02	-53.54	-13	-40.54	H
3.386801	33.08	Pk	32.4	.6	-95.2	-26.02	-55.14	-13	-42.14	V

10.1.3. WCDMA BAND 2

REL 99 MODE

Project #:	4790592262
Date:	02/23/2023
Test Engineer:	27661
Configuration:	EUT Only
Mode:	REL 99 Band 2
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.713906	36.74	Pk	33.1	-95.2	-25.05	-50.41	-13	-37.41	V
3.714375	36.39	Pk	33.1	-95.2	-25.03	-50.74	-13	-37.74	H
5.545313	34.57	Pk	34.7	-95.2	-21.55	-47.48	-13	-34.48	V
5.562656	35.27	Pk	34.7	-95.2	-21.32	-46.55	-13	-33.55	H
7.419844	32.04	Pk	35.5	-95.2	-18.69	-46.35	-13	-33.35	V
7.428750	32.68	Pk	35.4	-95.2	-18.76	-45.88	-13	-32.88	H
Mid Channel, 1880MHz									
3.725625	35.85	Pk	33.1	-95.2	-24.88	-51.13	-13	-38.13	V
3.736406	37.54	Pk	33.0	-95.2	-24.76	-49.42	-13	-36.42	H
5.625000	33.74	Pk	34.6	-95.2	-20.62	-47.48	-13	-34.48	V
5.640000	34.44	Pk	34.6	-95.2	-20.72	-46.88	-13	-33.88	H
7.499531	33.18	Pk	35.5	-95.2	-18.91	-45.43	-13	-32.43	H
7.513594	32.27	Pk	35.4	-95.2	-18.78	-46.31	-13	-33.31	V
High Channel, 1907.6MHz									
3.798281	35.19	Pk	33.1	-95.2	-25.04	-51.95	-13	-38.95	V
3.802500	36.55	Pk	33.0	-95.2	-25.07	-50.72	-13	-37.72	H
5.698125	34.67	Pk	34.7	-95.2	-21.37	-47.20	-13	-34.20	V
5.702813	34.30	Pk	34.7	-95.2	-21.37	-47.57	-13	-34.57	H
7.633125	32.31	Pk	35.6	-95.2	-17.81	-45.10	-13	-32.10	V
7.638750	32.21	Pk	35.6	-95.2	-17.73	-45.12	-13	-32.12	H

HSDPA MODE

Project #:	4790592262
Date:	02/23/2023
Test Engineer:	27661
Configuration:	EUT Only
Mode:	HSDPA Band 2
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.724688	35.74	Pk	33.1	-95.2	-24.89	-51.25	-13	-38.25	V
3.726563	36.58	Pk	33.1	-95.2	-24.89	-50.41	-13	-37.41	H
5.562188	33.83	Pk	34.7	-95.2	-21.34	-48.01	-13	-35.01	V
5.57625	33.87	Pk	34.7	-95.2	-21.10	-47.73	-13	-34.73	H
7.014844	32.71	Pk	35.5	-95.2	-18.75	-45.74	-13	-32.74	H
7.032188	32.10	Pk	35.5	-95.2	-18.64	-46.24	-13	-33.24	V
Mid Channel, 1880MHz									
3.773438	36.86	Pk	33.0	-95.2	-24.93	-50.27	-13	-37.27	H
3.780469	35.33	Pk	33.0	-95.2	-24.96	-51.83	-13	-38.83	V
5.626875	33.83	Pk	34.7	-95.2	-20.57	-47.24	-13	-34.24	H
5.642813	34.75	Pk	34.6	-95.2	-20.73	-46.58	-13	-33.58	V
7.466719	32.86	Pk	35.5	-95.2	-19.04	-45.88	-13	-32.88	V
7.496719	32.9	Pk	35.5	-95.2	-18.92	-45.72	-13	-32.72	H
High Channel, 1907.6MHz									
3.804375	37.17	Pk	33	-95.2	-25.00	-50.03	-13	-37.03	V
3.810000	36.95	Pk	33	-95.2	-25.04	-50.29	-13	-37.29	H
5.700938	32.69	Pk	34.7	-95.2	-21.32	-49.13	-13	-36.13	V
5.71875	35.04	Pk	34.7	-95.2	-21.62	-47.08	-13	-34.08	H
7.621875	32.44	Pk	35.5	-95.2	-17.88	-45.14	-13	-32.14	H
7.650000	32.58	Pk	35.6	-95.2	-17.77	-44.79	-13	-31.79	V

10.1.4. WCDMA BAND 4

REL 99 MODE

Project #:	4790592262
Date:	02/23/2023
Test Engineer:	27661
Configuration:	EUT Only
Mode:	REL 99 Band 4
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.418594	34.28	Pk	32.6	-95.2	-25.77	-54.09	-13	-41.09	V
3.419063	35.45	Pk	32.6	-95.2	-25.76	-52.91	-13	-39.91	H
5.106563	34.96	Pk	34.4	-95.2	-22.03	-47.87	-13	-34.87	V
5.136563	35.00	Pk	34.4	-95.2	-22.46	-48.26	-13	-35.26	H
6.846094	32.90	Pk	35.5	-95.2	-19.85	-46.65	-13	-33.65	H
6.876094	31.88	Pk	35.5	-95.2	-20.02	-47.84	-13	-34.84	V
Mid Channel, 1732.6MHz									
3.471563	35.73	Pk	32.5	-95.2	-25.2	-52.17	-13	-39.17	V
3.473906	35.32	Pk	32.5	-95.2	-25.21	-52.59	-13	-39.59	H
5.168906	34.66	Pk	34.4	-95.2	-22.99	-49.13	-13	-36.13	H
5.172188	34.57	Pk	34.4	-95.2	-22.96	-49.19	-13	-36.19	V
6.900469	32.69	Pk	35.4	-95.2	-19.87	-46.98	-13	-33.98	V
6.925781	34.19	Pk	35.5	-95.2	-19.66	-45.17	-13	-32.17	H
High Channel, 1752.61MHz									
3.487031	34.17	Pk	32.5	-95.2	-24.71	-53.24	-13	-40.24	V
3.488906	35.70	Pk	32.6	-95.2	-24.65	-51.55	-13	-38.55	H
5.251875	35.18	Pk	34.6	-95.2	-22.41	-47.83	-13	-34.83	H
5.262188	34.14	Pk	34.6	-95.2	-22.32	-48.78	-13	-35.78	V
6.976875	33.30	Pk	35.4	-95.2	-19.19	-45.69	-13	-32.69	V
7.006875	33.07	Pk	35.5	-95.2	-18.82	-45.45	-13	-32.45	H

HSDPA MODE

Project #:	4790592262
Date:	02/23/2023
Test Engineer:	27661
Configuration:	EUT Only
Mode:	HSDPA Band 4
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.402188	33.93	Pk	32.5	-95.2	-25.77	-54.54	-13	-41.54	V
3.417188	35.42	Pk	32.6	-95.2	-25.85	-53.03	-13	-40.03	H
5.107500	33.33	Pk	34.4	-95.2	-22.05	-49.52	-13	-36.52	V
5.114531	34.39	Pk	34.4	-95.2	-22.12	-48.53	-13	-35.53	H
6.855000	33.27	Pk	35.5	-95.2	-19.94	-46.37	-13	-33.37	V
6.863438	33.43	Pk	35.4	-95.2	-20.00	-46.37	-13	-33.37	H
Mid Channel, 1732.6MHz									
3.449531	35.78	Pk	32.5	-95.2	-25.50	-52.42	-13	-39.42	V
3.468281	35.08	Pk	32.5	-95.2	-25.31	-52.93	-13	-39.93	H
5.171250	34.32	Pk	34.4	-95.2	-22.98	-49.46	-13	-36.46	V
5.176406	34.49	Pk	34.4	-95.2	-23.07	-49.38	-13	-36.38	H
6.929531	31.96	Pk	35.5	-95.2	-19.59	-47.33	-13	-34.33	V
6.933281	33.34	Pk	35.5	-95.2	-19.54	-45.90	-13	-32.90	H
High Channel, 1752.61MHz									
3.517969	34.02	Pk	32.5	-95.2	-24.39	-53.07	-13	-40.07	V
3.521719	34.12	Pk	32.5	-95.2	-24.25	-52.83	-13	-39.83	H
5.257031	33.39	Pk	34.6	-95.2	-22.37	-49.58	-13	-36.58	V
5.280469	33.38	Pk	34.6	-95.2	-22.21	-49.43	-13	-36.43	H
7.030313	31.97	Pk	35.5	-95.2	-18.62	-46.35	-13	-33.35	H
7.046250	31.58	Pk	35.5	-95.2	-18.76	-46.88	-13	-33.88	V

10.2. FIELD STRENGTH OF SPURIOUS RADIATION, ANT2

10.2.1. GSM 850

GPRS MODE

Project #:	4790592262
Date:	02/22/2023
Test Engineer:	32145
Configuration:	EUT Only
Mode:	GPRS 850
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 824.2 MHz										
1.653689	37.48	Pk	28.4	.8	-95.2	-28.92	-57.44	-13	-44.44	H
1.653689	37.91	Pk	28.4	.8	-95.2	-28.92	-57.01	-13	-44.01	V
2.454489	36.12	Pk	32.2	.5	-95.2	-27.58	-53.96	-13	-40.96	V
2.465734	36.49	Pk	32.3	.5	-95.2	-27.64	-53.55	-13	-40.55	H
3.299289	35.96	Pk	32.8	.8	-95.2	-26.09	-51.73	-13	-38.73	H
3.305156	35.19	Pk	32.7	.7	-95.2	-26.06	-52.67	-13	-39.67	V
Mid Channel, 836.6 MHz										
1.688400	36.90	Pk	28.7	.7	-95.2	-28.64	-57.54	-13	-44.54	V
1.689867	36.95	Pk	28.8	.7	-95.2	-28.65	-57.40	-13	-44.40	H
2.489200	36.25	Pk	32.2	.6	-95.2	-27.54	-53.69	-13	-40.69	V
2.504845	36.04	Pk	32.2	.7	-95.2	-27.46	-53.72	-13	-40.72	H
3.332534	36.66	Pk	32.6	.5	-95.2	-26.25	-51.69	-13	-38.69	H
3.334489	35.43	Pk	32.5	.5	-95.2	-26.17	-52.94	-13	-39.94	V
High Channel, 848.8 MHz										
1.709422	37.39	Pk	29	.6	-95.2	-28.71	-56.92	-13	-43.92	H
1.712356	37.43	Pk	29	.6	-95.2	-28.66	-56.83	-13	-43.83	V
2.531245	36.34	Pk	32.2	.7	-95.2	-27.37	-53.33	-13	-40.33	V
2.538089	36.21	Pk	32.2	.7	-95.2	-27.42	-53.51	-13	-40.51	H
3.399023	35.75	Pk	32.5	.6	-95.2	-25.81	-52.16	-13	-39.16	H
3.408312	35.32	Pk	32.5	.5	-95.2	-25.76	-52.64	-13	-39.64	V

EGPRS MODE

Project #:	4790592262
Date:	02/22/2023
Test Engineer:	32145
Configuration:	EUT Only
Mode:	EGPRS 850
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 824.2 MHz										
1.625333	37.25	Pk	28.2	.6	-95.2	-28.87	-58.02	-13	-45.02	V
1.630222	38.03	Pk	28.3	.7	-95.2	-28.8	-56.97	-13	-43.97	H
2.480889	35.45	Pk	32.3	.5	-95.2	-27.57	-54.52	-13	-41.52	V
2.490178	35.77	Pk	32.2	.6	-95.2	-27.51	-54.14	-13	-41.14	H
3.290489	35.02	Pk	32.9	.8	-95.2	-25.94	-52.42	-13	-39.42	V
3.295867	35.04	Pk	32.8	.8	-95.2	-26.09	-52.65	-13	-39.65	H
Mid Channel, 836.6 MHz										
1.666889	36.72	Pk	28.5	.7	-95.2	-28.76	-58.04	-13	-45.04	V
1.6708	37.29	Pk	28.6	.7	-95.2	-28.86	-57.47	-13	-44.47	H
2.513645	35.82	Pk	32.2	.7	-95.2	-27.39	-53.87	-13	-40.87	V
2.521467	35.46	Pk	32.2	.8	-95.2	-27.34	-54.08	-13	-41.08	H
3.334	34.44	Pk	32.5	.5	-95.2	-26.17	-53.93	-13	-40.93	V
3.347689	35.97	Pk	32.5	.5	-95.2	-26.18	-52.41	-13	-39.41	H
High Channel, 848.8 MHz										
1.668356	37.83	Pk	28.5	.7	-95.2	-28.75	-56.92	-13	-43.92	V
1.680578	36.48	Pk	28.6	.7	-95.2	-28.66	-58.08	-13	-45.08	H
2.545911	36.35	Pk	32.3	.6	-95.2	-27.34	-53.29	-13	-40.29	H
2.554711	35.50	Pk	32.4	.5	-95.2	-27.23	-54.03	-13	-41.03	V
3.399512	36.35	Pk	32.5	.6	-95.2	-25.78	-51.53	-13	-38.53	H
3.406845	34.47	Pk	32.5	.6	-95.2	-25.74	-53.37	-13	-40.37	V

10.2.2. GSM 1900

GPRS MODE

Project #:	4790592262
Date:	02/22/2023
Test Engineer:	32145
Configuration:	EUT Only
Mode:	GPRS 1900
Chamber #:	01-RDE-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, 1850.2MHz									
3.712500	36.80	Pk	33.0	-95.2	-25.03	-50.43	-13	-37.43	V
3.712969	37.45	Pk	33.0	-95.2	-25.04	-49.79	-13	-36.79	H
5.512969	33.35	Pk	34.6	-95.2	-22.02	-49.27	-13	-36.27	V
5.545781	34.07	Pk	34.7	-95.2	-21.54	-47.97	-13	-34.97	H
7.399219	32.58	Pk	35.4	-95.2	-18.36	-45.58	-13	-32.58	H
7.407656	32.45	Pk	35.5	-95.2	-18.54	-45.79	-13	-32.79	V
Mid Channel, 1880MHz									
3.776250	37.09	Pk	33.0	-95.2	-24.91	-50.02	-13	-37.02	H
3.777656	36.92	Pk	33.0	-95.2	-24.96	-50.24	-13	-37.24	V
5.632031	34.26	Pk	34.7	-95.2	-20.6	-46.84	-13	-33.84	H
5.636719	33.21	Pk	34.6	-95.2	-20.64	-48.03	-13	-35.03	V
7.516875	32.39	Pk	35.4	-95.2	-18.71	-46.12	-13	-33.12	V
7.532344	32.30	Pk	35.5	-95.2	-18.47	-45.87	-13	-32.87	H
High Channel, 1909.8MHz									
3.805313	36.58	Pk	33	-95.2	-25.03	-50.65	-13	-37.65	V
3.818438	36.72	Pk	32.9	-95.2	-25.04	-50.62	-13	-37.62	H
5.731406	33.45	Pk	34.8	-95.2	-21.70	-48.65	-13	-35.65	V
5.741250	34.40	Pk	34.8	-95.2	-21.79	-47.79	-13	-34.79	H
7.614844	32.83	Pk	35.5	-95.2	-17.79	-44.66	-13	-31.66	V
7.626094	33.80	Pk	35.5	-95.2	-17.88	-43.78	-13	-30.78	H

EGPRS MODE

Project #:	4790592262
Date:	02/24/2023
Test Engineer:	27661
Configuration:	EUT Only
Mode:	EGPRS 1900
Chamber #:	01-RDE-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, 1850.2MHz									
3.705469	35.44	Pk	33	-95.2	-25.11	-51.87	-13	-38.87	V
3.718125	35.87	Pk	33.1	-95.2	-24.90	-51.13	-13	-38.13	H
5.563594	34.10	Pk	34.7	-95.2	-21.29	-47.69	-13	-34.69	V
5.567344	33.83	Pk	34.7	-95.2	-21.27	-47.94	-13	-34.94	H
7.393125	31.97	Pk	35.4	-95.2	-18.24	-46.07	-13	-33.07	H
7.409063	32.8	Pk	35.5	-95.2	-18.58	-45.48	-13	-32.48	V
Mid Channel, 1880MHz									
3.751406	36.11	Pk	32.9	-95.2	-24.81	-51.00	-13	-38.00	V
3.768750	37.30	Pk	32.9	-95.2	-24.89	-49.89	-13	-36.89	H
5.629688	33.61	Pk	34.7	-95.2	-20.56	-47.45	-13	-34.45	H
5.633438	33.21	Pk	34.7	-95.2	-20.6	-47.89	-13	-34.89	V
7.522500	32.87	Pk	35.5	-95.2	-18.6	-45.43	-13	-32.43	H
7.533281	32.37	Pk	35.5	-95.2	-18.47	-45.80	-13	-32.80	V
High Channel, 1909.8MHz									
3.817031	37.29	Pk	32.9	-95.2	-25.06	-50.07	-13	-37.07	V
3.819844	37.54	Pk	32.9	-95.2	-25.06	-49.82	-13	-36.82	H
5.728061	36.29	Pk	34.8	-95.2	-21.70	-45.81	-13	-32.81	V
5.734845	36.57	Pk	34.8	-95.2	-21.72	-45.55	-13	-32.55	H
7.644375	32.55	Pk	35.6	-95.2	-17.71	-44.76	-13	-31.76	H
7.672500	32.06	Pk	35.6	-95.2	-18.09	-45.63	-13	-32.63	V

10.2.3. WCDMA BAND 5

REL 99 MODE

Project #:	4790592262
Date:	02/23/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	REL 99 Band 5
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 826.4MHz										
1.654667	38.52	Pk	28.4	.8	-95.2	-28.99	-56.47	-13	-43.47	H
1.654667	36.58	Pk	28.4	.8	-95.2	-28.99	-58.41	-13	-45.41	V
2.475454	43.83	Pk	32.3	.5	-95.2	-27.49	-46.06	-13	-33.06	H
2.482356	36.10	Pk	32.3	.5	-95.2	-27.54	-53.84	-13	-40.84	V
3.305156	33.73	Pk	32.7	.7	-95.2	-26.06	-54.13	-13	-41.13	H
3.305156	35.92	Pk	32.7	.7	-95.2	-26.06	-51.94	-13	-38.94	V
Mid Channel, 836.6MHz										
1.672756	37.23	Pk	28.6	.7	-95.2	-28.76	-57.43	-13	-44.43	H
1.673733	35.9	Pk	28.6	.7	-95.2	-28.67	-58.67	-13	-45.67	V
2.507773	44.62	Pk	32.2	.7	-95.2	-27.51	-45.19	-13	-32.19	H
2.510711	36.72	Pk	32.2	.7	-95.2	-27.49	-53.07	-13	-40.07	V
3.346712	34.41	Pk	32.5	.5	-95.2	-26.23	-54.02	-13	-41.02	H
3.346712	35.07	Pk	32.5	.5	-95.2	-26.23	-53.36	-13	-40.36	V
High Channel, 846.6MHz										
1.694756	36.73	Pk	28.9	.7	-95.2	-28.77	-57.64	-13	-44.64	H
1.694756	36.18	Pk	28.9	.7	-95.2	-28.77	-58.19	-13	-45.19	V
2.536140	48.15	Pk	32.2	.7	-95.2	-27.36	-41.51	-13	-28.51	H
2.540534	35.56	Pk	32.3	.7	-95.2	-27.33	-53.97	-13	-40.97	V
3.385334	33.28	Pk	32.4	.6	-95.2	-25.99	-54.91	-13	-41.91	H
3.385823	33.24	Pk	32.4	.6	-95.2	-25.99	-54.95	-13	-41.95	V

HSDPA MODE

Project #:	4790592262
Date:	02/24/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	HSDPA Band 5
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	HPF 1.2GHz T1737 1-18GHz	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 826.4MHz										
1.654178	36.86	Pk	28.4	.8	-95.2	-28.95	-58.09	-13	-45.09	H
1.654178	36.15	Pk	28.4	.8	-95.2	-28.95	-58.80	-13	-45.80	V
2.480400	33.87	Pk	32.3	.5	-95.2	-27.58	-56.11	-13	-43.11	V
2.481341	44.29	Pk	32.3	.5	-95.2	-27.56	-45.67	-13	-32.67	H
3.305156	32.93	Pk	32.7	.7	-95.2	-26.06	-54.93	-13	-41.93	H
3.305156	34.23	Pk	32.7	.7	-95.2	-26.06	-53.63	-13	-40.63	V
Mid Channel, 836.6MHz										
1.674222	35.76	Pk	28.6	.7	-95.2	-28.64	-58.78	-13	-45.78	H
1.674222	37.21	Pk	28.6	.7	-95.2	-28.64	-57.33	-13	-44.33	V
2.512256	44.87	Pk	32.2	.7	-95.2	-27.41	-44.84	-13	-31.84	H
2.513156	35.83	Pk	32.2	.7	-95.2	-27.4	-53.87	-13	-40.87	V
3.346712	33.67	Pk	32.5	.5	-95.2	-26.23	-54.76	-13	-41.76	H
3.346712	34.02	Pk	32.5	.5	-95.2	-26.23	-54.41	-13	-41.41	V
High Channel, 846.6MHz										
1.693778	35.37	Pk	28.8	.7	-95.2	-28.84	-59.17	-13	-46.17	H
1.693778	34.66	Pk	28.8	.7	-95.2	-28.84	-59.88	-13	-46.88	V
2.536775	47.04	Pk	32.2	.7	-95.2	-27.39	-42.65	-13	-29.65	H
2.540534	35.92	Pk	32.3	.7	-95.2	-27.33	-53.61	-13	-40.61	V
3.387778	34.18	Pk	32.4	.6	-95.2	-26.06	-54.08	-13	-41.08	V
3.388267	35.83	Pk	32.4	.6	-95.2	-26.07	-52.44	-13	-39.44	H

10.2.4. WCDMA BAND 2

REL 99 MODE

Project #:	4790592262
Date:	02/24/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	REL 99 Band 2
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.705000	37.18	Pk	33.0	-95.2	-25.10	-50.12	-13	-37.12	H
3.705000	35.10	Pk	33.0	-95.2	-25.10	-52.20	-13	-39.20	V
5.557969	34.24	Pk	34.6	-95.2	-21.37	-47.73	-13	-34.73	H
5.557969	31.86	Pk	34.6	-95.2	-21.37	-50.11	-13	-37.11	V
7.409063	31.92	Pk	35.5	-95.2	-18.58	-46.36	-13	-33.36	H
7.409063	30.59	Pk	35.5	-95.2	-18.58	-47.69	-13	-34.69	V
Mid Channel, 1880MHz									
3.760313	34.97	Pk	32.9	-95.2	-24.87	-52.20	-13	-39.20	H
3.760313	35.81	Pk	32.9	-95.2	-24.87	-51.36	-13	-38.36	V
5.638125	34.48	Pk	34.6	-95.2	-20.68	-46.80	-13	-33.80	V
5.639063	32.13	Pk	34.7	-95.2	-20.71	-49.08	-13	-36.08	H
7.521094	31.83	Pk	35.4	-95.2	-18.63	-46.60	-13	-33.60	H
7.521563	31.29	Pk	35.5	-95.2	-18.62	-47.03	-13	-34.03	V
High Channel, 1907.6MHz									
3.814219	35.92	Pk	33	-95.2	-25.09	-51.37	-13	-38.37	V
3.814688	34.46	Pk	32.9	-95.2	-25.10	-52.94	-13	-39.94	H
5.722969	34.63	Pk	34.7	-95.2	-21.65	-47.52	-13	-34.52	V
5.723906	31.82	Pk	34.8	-95.2	-21.67	-50.25	-13	-37.25	H
7.629844	32.03	Pk	35.6	-95.2	-17.86	-45.43	-13	-32.43	H
7.629844	31.20	Pk	35.6	-95.2	-17.86	-46.26	-13	-33.26	V

HSDPA MODE

Project #:	4790592262
Date:	02/27/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	HSDPA Band 2
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.704063	36.08	Pk	33	-95.2	-25.08	-51.20	-13	-38.20	H
3.704063	33.46	Pk	33	-95.2	-25.08	-53.82	-13	-40.82	V
5.557969	34.52	Pk	34.6	-95.2	-21.37	-47.45	-13	-34.45	H
5.558906	31.82	Pk	34.7	-95.2	-21.37	-50.05	-13	-37.05	V
7.409063	29.83	Pk	35.5	-95.2	-18.58	-48.45	-13	-35.45	V
7.409297	31.38	Pk	35.5	-95.2	-18.59	-46.91	-13	-33.91	H
Mid Channel, 1880MHz									
3.760781	36.40	Pk	32.9	-95.2	-24.88	-50.78	-13	-37.78	H
3.761719	35.45	Pk	32.9	-95.2	-24.91	-51.76	-13	-38.76	V
5.640938	33.27	Pk	34.6	-95.2	-20.71	-48.04	-13	-35.04	V
5.641406	35.68	Pk	34.6	-95.2	-20.72	-45.64	-13	-32.64	H
7.519688	30.69	Pk	35.4	-95.2	-18.66	-47.77	-13	-34.77	V
7.520156	30.29	Pk	35.4	-95.2	-18.64	-48.15	-13	-35.15	H
High Channel, 1907.6MHz									
3.815156	36.50	Pk	32.9	-95.2	-25.11	-50.91	-13	-37.91	H
3.815625	34.86	Pk	32.9	-95.2	-25.10	-52.54	-13	-39.54	V
5.724375	31.83	Pk	34.8	-95.2	-21.67	-50.24	-13	-37.24	H
5.724375	34.01	Pk	34.8	-95.2	-21.67	-48.06	-13	-35.06	V
7.629844	31.06	Pk	35.6	-95.2	-17.86	-46.4	-13	-33.40	V
7.630313	30.57	Pk	35.6	-95.2	-17.85	-46.88	-13	-33.88	H

10.2.5. WCDMA BAND 4

REL 99 MODE

Project #:	4790592262
Date:	02/24/2023
Test Engineer:	27661
Configuration:	EUT Only
Mode:	REL 99 Band 4
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.428906	35.15	Pk	32.6	-95.2	-25.8	-53.25	-13	-40.25	H
3.429844	34.90	Pk	32.5	-95.2	-25.83	-53.63	-13	-40.63	V
5.135625	35.83	Pk	34.4	-95.2	-22.44	-47.41	-13	-34.41	H
5.146875	34.88	Pk	34.4	-95.2	-22.72	-48.64	-13	-35.64	V
6.830156	34.41	Pk	35.4	-95.2	-19.76	-45.15	-13	-32.15	H
6.831094	31.88	Pk	35.4	-95.2	-19.75	-47.67	-13	-34.67	V
Mid Channel, 1732.6MHz									
3.466875	34.65	Pk	32.5	-95.2	-25.36	-53.41	-13	-40.41	V
3.468750	34.79	Pk	32.5	-95.2	-25.27	-53.18	-13	-40.18	H
5.200781	34.18	Pk	34.5	-95.2	-22.97	-49.49	-13	-36.49	H
5.201719	34.61	Pk	34.5	-95.2	-22.96	-49.05	-13	-36.05	V
6.790781	30.98	Pk	35.5	-95.2	-19.14	-47.86	-13	-34.86	V
6.825000	33.47	Pk	35.4	-95.2	-19.67	-46.00	-13	-33.00	H
High Channel, 1752.61MHz									
3.484219	34.40	Pk	32.5	-95.2	-24.76	-53.06	-13	-40.06	V
3.487031	35.27	Pk	32.5	-95.2	-24.71	-52.14	-13	-39.14	H
5.248125	35.21	Pk	34.6	-95.2	-22.49	-47.88	-13	-34.88	V
5.272969	33.99	Pk	34.6	-95.2	-22.18	-48.79	-13	-35.79	H
7.025156	31.41	Pk	35.5	-95.2	-18.67	-46.96	-13	-33.96	V
7.025625	32.29	Pk	35.5	-95.2	-18.67	-46.08	-13	-33.08	H

HSDPA MODE

Project #:	4790592262
Date:	02/27/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	HSDPA Band 4
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.465469	33.93	Pk	32.5	-95.2	-25.37	-54.14	-13	-41.14	H
3.465469	32.39	Pk	32.5	-95.2	-25.37	-55.68	-13	-42.68	V
5.198438	33.51	Pk	34.5	-95.2	-23.02	-50.21	-13	-37.21	H
5.198906	33.49	Pk	34.5	-95.2	-23.02	-50.23	-13	-37.23	V
6.927656	31.77	Pk	35.5	-95.2	-19.64	-47.57	-13	-34.57	V
6.928125	31.38	Pk	35.5	-95.2	-19.63	-47.95	-13	-34.95	H
Mid Channel, 1732.6MHz									
3.464531	35.10	Pk	32.5	-95.2	-25.36	-52.96	-13	-39.96	H
3.464531	33.48	Pk	32.5	-95.2	-25.36	-54.58	-13	-41.58	V
5.197500	32.65	Pk	34.5	-95.2	-23.03	-51.08	-13	-38.08	H
5.197500	33.83	Pk	34.5	-95.2	-23.03	-49.9	-13	-36.90	V
6.930469	31.88	Pk	35.5	-95.2	-19.57	-47.39	-13	-34.39	V
6.932813	31.31	Pk	35.5	-95.2	-19.54	-47.93	-13	-34.93	H
High Channel, 1752.61MHz									
3.506719	34.06	Pk	32.5	-95.2	-24.37	-53.01	-13	-40.01	V
3.507656	34.25	Pk	32.5	-95.2	-24.37	-52.82	-13	-39.82	H
5.258906	34.24	Pk	34.6	-95.2	-22.29	-48.65	-13	-35.65	H
5.259844	33.54	Pk	34.6	-95.2	-22.30	-49.36	-13	-36.36	V
7.009688	31.05	Pk	35.5	-95.2	-18.80	-47.45	-13	-34.45	H
7.010156	31.22	Pk	35.5	-95.2	-18.80	-47.28	-13	-34.28	V

10.3. FIELD STRENGTH OF SPURIOUS RADIATION, ANT3

10.3.1. GSM 1900

GPRS MODE

Project #:	4790592262
Date:	03/2/22023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	GPRS 1900
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
3.700781	36.76	Pk	32.9	-95.2	-25.09	-50.63	-13	-37.63	V
3.702188	37.31	Pk	33.0	-95.2	-25.06	-49.95	-13	-36.95	H
5.550469	32.71	Pk	34.6	-95.2	-21.43	-49.32	-13	-36.32	V
5.550938	35.31	Pk	34.6	-95.2	-21.44	-46.73	-13	-33.73	H
7.400156	32.22	Pk	35.5	-95.2	-18.38	-45.86	-13	-32.86	H
7.401094	31.98	Pk	35.5	-95.2	-18.41	-46.13	-13	-33.13	V
Mid Channel, 1880MHz									
3.758438	36.93	Pk	32.8	-95.2	-24.9	-50.37	-13	-37.37	H
3.760313	36.90	Pk	32.9	-95.2	-24.87	-50.27	-13	-37.27	V
5.639063	33.57	Pk	34.7	-95.2	-20.71	-47.64	-13	-34.64	V
5.639531	33.32	Pk	34.6	-95.2	-20.72	-48.00	-13	-35.00	H
7.520156	31.93	Pk	35.4	-95.2	-18.64	-46.51	-13	-33.51	H
7.520625	31.79	Pk	35.4	-95.2	-18.63	-46.64	-13	-33.64	V
High Channel, 1909.8MHz									
3.817969	37.27	Pk	32.9	-95.2	-25.05	-50.08	-13	-37.08	H
3.817969	37.81	Pk	32.9	-95.2	-25.05	-49.54	-13	-36.54	V
5.730469	34.27	Pk	34.8	-95.2	-21.68	-47.81	-13	-34.81	V
5.731406	34.87	Pk	34.8	-95.2	-21.7	-47.23	-13	-34.23	H
7.638281	32.75	Pk	35.6	-95.2	-17.74	-44.59	-13	-31.59	H
7.639688	32.10	Pk	35.6	-95.2	-17.73	-45.23	-13	-32.23	V

EGPRS MODE

Project #:	4790592262
Date:	03/3/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	EGPRS 1900
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
3.750000	36.98	Pk	32.9	-95.2	-24.81	-50.13	-13	-37.13	H
3.750000	35.81	Pk	32.9	-95.2	-24.81	-51.30	-13	-38.30	V
5.550469	34.09	Pk	34.6	-95.2	-21.43	-47.94	-13	-34.94	V
5.551875	34.8	Pk	34.6	-95.2	-21.47	-47.27	-13	-34.27	H
7.400156	31.34	Pk	35.5	-95.2	-18.38	-46.74	-13	-33.74	H
7.400625	32.58	Pk	35.5	-95.2	-18.4	-45.52	-13	-32.52	V
Mid Channel, 1880MHz									
3.760781	35.6	Pk	32.9	-95.2	-24.88	-51.58	-13	-38.58	V
3.762188	36.24	Pk	32.9	-95.2	-24.93	-50.99	-13	-37.99	H
5.640469	33.46	Pk	34.6	-95.2	-20.72	-47.86	-13	-34.86	V
5.641406	32.47	Pk	34.6	-95.2	-20.72	-48.85	-13	-35.85	H
7.519688	32.55	Pk	35.4	-95.2	-18.66	-45.91	-13	-32.91	H
7.521563	32.08	Pk	35.5	-95.2	-18.62	-46.24	-13	-33.24	V
High Channel, 1909.8MHz									
3.819844	35.99	Pk	32.9	-95.2	-25.06	-51.37	-13	-38.37	V
3.820781	36.89	Pk	32.9	-95.2	-25.09	-50.5	-13	-37.50	H
5.730000	32.03	Pk	34.8	-95.2	-21.67	-50.04	-13	-37.04	H
5.730000	34.41	Pk	34.8	-95.2	-21.67	-47.66	-13	-34.66	V
7.639688	32.99	Pk	35.6	-95.2	-17.73	-44.34	-13	-31.34	H
7.639688	31.11	Pk	35.6	-95.2	-17.73	-46.22	-13	-33.22	V

10.3.2. WCDMA BAND 2

REL 99 MODE

Project #:	4790592262
Date:	02/28/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	REL 99 Band 2
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.705469	38.36	Pk	33.0	-95.2	-25.11	-48.95	-13	-35.95	V
3.705938	36.47	Pk	33.0	-95.2	-25.12	-50.85	-13	-37.85	H
5.556094	32.27	Pk	34.6	-95.2	-21.39	-49.72	-13	-36.72	H
5.557500	32.82	Pk	34.7	-95.2	-21.37	-49.05	-13	-36.05	V
7.406250	33.48	Pk	35.5	-95.2	-18.51	-44.73	-13	-31.73	H
7.407656	31.36	Pk	35.5	-95.2	-18.54	-46.88	-13	-33.88	V
Mid Channel, 1880MHz									
3.759844	35.8	Pk	32.9	-95.2	-24.86	-51.36	-13	-38.36	H
3.761250	34.86	Pk	32.9	-95.2	-24.89	-52.33	-13	-39.33	V
5.640000	33.61	Pk	34.6	-95.2	-20.72	-47.71	-13	-34.71	H
5.640938	33.63	Pk	34.6	-95.2	-20.71	-47.68	-13	-34.68	V
7.520156	32.82	Pk	35.4	-95.2	-18.64	-45.62	-13	-32.62	H
7.521563	30.85	Pk	35.5	-95.2	-18.62	-47.47	-13	-34.47	V
High Channel, 1907.6MHz									
3.814219	35.99	Pk	33	-95.2	-25.09	-51.30	-13	-38.30	H
3.816094	36.74	Pk	32.9	-95.2	-25.09	-50.65	-13	-37.65	V
5.722031	34.11	Pk	34.7	-95.2	-21.64	-48.03	-13	-35.03	V
5.723906	33.90	Pk	34.8	-95.2	-21.67	-48.17	-13	-35.17	H
7.631719	31.46	Pk	35.6	-95.2	-17.84	-45.98	-13	-32.98	V
7.632188	32.73	Pk	35.6	-95.2	-17.83	-44.70	-13	-31.70	H

HSDPA MODE

Project #:	
Date:	02/28/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	HSDPA Band 2
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.703125	35.68	Pk	33.0	-95.2	-25.08	-51.60	-13	-38.60	V
3.704531	35.98	Pk	33.0	-95.2	-25.09	-51.31	-13	-38.31	H
5.557031	32.23	Pk	34.7	-95.2	-21.37	-49.64	-13	-36.64	H
5.557969	33.55	Pk	34.6	-95.2	-21.37	-48.42	-13	-35.42	V
7.409063	30.64	Pk	35.5	-95.2	-18.58	-47.64	-13	-34.64	V
7.409531	31.31	Pk	35.5	-95.2	-18.6	-46.99	-13	-33.99	H
Mid Channel, 1880MHz									
3.759844	35.67	Pk	32.9	-95.2	-24.86	-51.49	-13	-38.49	V
3.760313	35.02	Pk	32.9	-95.2	-24.87	-52.15	-13	-39.15	H
5.640000	32.90	Pk	34.6	-95.2	-20.72	-48.42	-13	-35.42	V
5.640938	33.66	Pk	34.6	-95.2	-20.71	-47.65	-13	-34.65	H
7.520156	31.03	Pk	35.4	-95.2	-18.64	-47.41	-13	-34.41	H
7.520625	32.12	Pk	35.4	-95.2	-18.63	-46.31	-13	-33.31	V
High Channel, 1907.6MHz									
3.813750	38.29	Pk	33	-95.2	-25.09	-49.00	-13	-36.00	V
3.814219	37.11	Pk	33	-95.2	-25.09	-50.18	-13	-37.18	H
5.719219	33.95	Pk	34.7	-95.2	-21.63	-48.18	-13	-35.18	V
5.720156	33.81	Pk	34.7	-95.2	-21.64	-48.33	-13	-35.33	H
7.627031	31.51	Pk	35.6	-95.2	-17.87	-45.96	-13	-32.96	H
7.628438	32.11	Pk	35.6	-95.2	-17.89	-45.38	-13	-32.38	V

10.3.3. WCDMA BAND 4

REL 99 MODE

Project #:	4790592262
Date:	02/28/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	REL 99 Band 4
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.424688	34.60	Pk	32.6	-95.2	-25.78	-53.78	-13	-40.78	H
3.424688	33.38	Pk	32.6	-95.2	-25.78	-55.00	-13	-42.00	V
5.137500	34.04	Pk	34.4	-95.2	-22.50	-49.26	-13	-36.26	H
5.137500	34.68	Pk	34.4	-95.2	-22.50	-48.62	-13	-35.62	V
6.850781	32.64	Pk	35.5	-95.2	-19.91	-46.97	-13	-33.97	H
6.850781	31.62	Pk	35.5	-95.2	-19.91	-47.99	-13	-34.99	V
Mid Channel, 1732.6MHz									
3.465469	32.84	Pk	32.5	-95.2	-25.37	-55.23	-13	-42.23	H
3.465938	34.08	Pk	32.5	-95.2	-25.38	-54.00	-13	-41.00	V
5.198906	32.67	Pk	34.5	-95.2	-23.02	-51.05	-13	-38.05	V
5.199375	33.44	Pk	34.5	-95.2	-23.00	-50.26	-13	-37.26	H
6.930469	31.35	Pk	35.5	-95.2	-19.57	-47.92	-13	-34.92	H
6.930469	32.49	Pk	35.5	-95.2	-19.57	-46.78	-13	-33.78	V
High Channel, 1752.61MHz									
3.504375	33.91	Pk	32.5	-95.2	-24.45	-53.24	-13	-40.24	H
3.504375	33.06	Pk	32.5	-95.2	-24.45	-54.09	-13	-41.09	V
5.257500	34.35	Pk	34.6	-95.2	-22.35	-48.60	-13	-35.60	H
5.258438	33.13	Pk	34.6	-95.2	-22.31	-49.78	-13	-36.78	V
7.010625	32.88	Pk	35.5	-95.2	-18.79	-45.61	-13	-32.61	H
7.010625	31.27	Pk	35.5	-95.2	-18.79	-47.22	-13	-34.22	V

HSDPA MODE

Project #:	4790592262
Date:	02/27/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	HSDPA Band 4
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.42375	34.26	Pk	32.6	-95.2	-25.83	-54.17	-13	-41.17	H
3.424688	33.06	Pk	32.6	-95.2	-25.78	-55.32	-13	-42.32	V
5.136094	33.55	Pk	34.4	-95.2	-22.44	-49.69	-13	-36.69	V
5.137031	33.73	Pk	34.4	-95.2	-22.48	-49.55	-13	-36.55	H
6.85125	31.46	Pk	35.5	-95.2	-19.92	-48.16	-13	-35.16	V
6.851719	31.18	Pk	35.5	-95.2	-19.91	-48.43	-13	-35.43	H
Mid Channel, 1732.6MHz									
3.466406	34.72	Pk	32.5	-95.2	-25.37	-53.35	-13	-40.35	H
3.466875	35.55	Pk	32.5	-95.2	-25.36	-52.51	-13	-39.51	V
5.198438	34.43	Pk	34.5	-95.2	-23.02	-49.29	-13	-36.29	V
5.199375	31.65	Pk	34.5	-95.2	-23	-52.05	-13	-39.05	H
6.931406	31.14	Pk	35.5	-95.2	-19.55	-48.11	-13	-35.11	H
6.931406	30.68	Pk	35.5	-95.2	-19.55	-48.57	-13	-35.57	V
High Channel, 1752.61MHz									
3.505313	33.1	Pk	32.5	-95.2	-24.41	-54.01	-13	-41.01	H
3.505313	32.41	Pk	32.5	-95.2	-24.41	-54.70	-13	-41.70	V
5.258438	32.49	Pk	34.6	-95.2	-22.31	-50.42	-13	-37.42	H
5.258438	32.29	Pk	34.6	-95.2	-22.31	-50.62	-13	-37.62	V
7.010625	30.00	Pk	35.5	-95.2	-18.79	-48.49	-13	-35.49	V
7.011094	30.74	Pk	35.5	-95.2	-18.78	-47.74	-13	-34.74	H

10.4. FIELD STRENGTH OF SPURIOUS RADIATION, ANT4

10.4.1. GSM 1900

GPRS MODE

Project #:	4790592262
Date:	03/3/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	GPRS 1900
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
3.698438	35.2	Pk	33	-95.2	-25.17	-52.17	-13	-39.17	H
3.699375	35.44	Pk	33	-95.2	-25.15	-51.91	-13	-38.91	V
5.551406	33.24	Pk	34.6	-95.2	-21.45	-48.81	-13	-35.81	H
5.551406	34.97	Pk	34.6	-95.2	-21.45	-47.08	-13	-34.08	V
7.398281	33.52	Pk	35.5	-95.2	-18.36	-44.54	-13	-31.54	H
7.400156	32.09	Pk	35.5	-95.2	-18.38	-45.99	-13	-32.99	V
Mid Channel, 1880MHz									
3.760313	34.44	Pk	32.9	-95.2	-24.87	-52.73	-13	-39.73	H
3.760313	34.95	Pk	32.9	-95.2	-24.87	-52.22	-13	-39.22	V
5.639063	32.28	Pk	34.7	-95.2	-20.71	-48.93	-13	-35.93	V
5.639531	32.67	Pk	34.6	-95.2	-20.72	-48.65	-13	-35.65	H
7.518750	30.47	Pk	35.4	-95.2	-18.69	-48.02	-13	-35.02	V
7.520156	30.11	Pk	35.4	-95.2	-18.64	-48.33	-13	-35.33	H
High Channel, 1909.8MHz									
3.820313	37.29	Pk	32.9	-95.2	-25.08	-50.09	-13	-37.09	V
3.820781	36.36	Pk	32.9	-95.2	-25.09	-51.03	-13	-38.03	H
5.731406	32.46	Pk	34.8	-95.2	-21.70	-49.64	-13	-36.64	H
5.731406	33.39	Pk	34.8	-95.2	-21.70	-48.71	-13	-35.71	V
7.642500	31.91	Pk	35.6	-95.2	-17.71	-45.40	-13	-32.40	V
7.642969	34.13	Pk	35.6	-95.2	-17.71	-43.18	-13	-30.18	H

EGPRS MODE

Project #:	4790592262
Date:	03/3/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	EGPRS 1900
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1850.2MHz									
3.699844	37.34	Pk	33.0	-95.2	-25.14	-50.00	-13	-37.00	H
3.700313	37.35	Pk	33.0	-95.2	-25.12	-49.97	-13	-36.97	V
3.761719	36.45	Pk	32.9	-95.2	-24.91	-50.76	-13	-37.76	V
5.550000	31.92	Pk	34.6	-95.2	-21.43	-50.11	-13	-37.11	H
5.550469	34.09	Pk	34.6	-95.2	-21.43	-47.94	-13	-34.94	V
7.399688	30.56	Pk	35.4	-95.2	-18.37	-47.61	-13	-34.61	H
Mid Channel, 1880MHz									
3.761719	34.53	Pk	32.9	-95.2	-24.91	-52.68	-13	-39.68	H
3.761719	36.45	Pk	32.9	-95.2	-24.91	-50.76	-13	-37.76	V
5.640938	32.30	Pk	34.6	-95.2	-20.71	-49.01	-13	-36.01	H
5.641406	33.40	Pk	34.6	-95.2	-20.72	-47.92	-13	-34.92	V
7.521563	34.06	Pk	35.5	-95.2	-18.62	-44.26	-13	-31.26	H
7.521563	30.55	Pk	35.5	-95.2	-18.62	-47.77	-13	-34.77	V
High Channel, 1909.8MHz									
3.820781	37.16	Pk	32.9	-95.2	-25.09	-50.23	-13	-37.23	H
3.820781	34.83	Pk	32.9	-95.2	-25.09	-52.56	-13	-39.56	V
5.729063	33.47	Pk	34.8	-95.2	-21.72	-48.65	-13	-35.65	V
5.729531	33.10	Pk	34.8	-95.2	-21.69	-48.99	-13	-35.99	H
7.638750	31.09	Pk	35.6	-95.2	-17.73	-46.24	-13	-33.24	H
7.640625	31.03	Pk	35.6	-95.2	-17.73	-46.30	-13	-33.30	V

10.4.2. WCDMA BAND 2

REL 99 MODE

Project #:	4790592262
Date:	03/1/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	REL 99 Band 2
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.705000	36.54	Pk	33.0	-95.2	-25.10	-50.76	-13	-37.76	V
3.705938	36.58	Pk	33.0	-95.2	-25.12	-50.74	-13	-37.74	H
5.556094	34.13	Pk	34.6	-95.2	-21.39	-47.86	-13	-34.86	V
5.557031	32.65	Pk	34.7	-95.2	-21.37	-49.22	-13	-36.22	H
7.410469	31.95	Pk	35.5	-95.2	-18.62	-46.37	-13	-33.37	H
7.411875	32.01	Pk	35.5	-95.2	-18.62	-46.31	-13	-33.31	V
Mid Channel, 1880MHz									
3.760313	34.77	Pk	32.9	-95.2	-24.87	-52.40	-13	-39.4	V
3.760781	36.59	Pk	32.9	-95.2	-24.88	-50.59	-13	-37.59	H
5.639063	31.80	Pk	34.7	-95.2	-20.71	-49.41	-13	-36.41	H
5.640000	32.49	Pk	34.6	-95.2	-20.72	-48.83	-13	-35.83	V
7.519688	31.80	Pk	35.4	-95.2	-18.66	-46.66	-13	-33.66	V
7.520625	31.79	Pk	35.4	-95.2	-18.63	-46.64	-13	-33.64	H
High Channel, 1907.6MHz									
3.815156	36.59	Pk	32.9	-95.2	-25.11	-50.82	-13	-37.82	V
3.815625	35.34	Pk	32.9	-95.2	-25.1	-52.06	-13	-39.06	H
5.722969	34.20	Pk	34.7	-95.2	-21.65	-47.95	-13	-34.95	V
5.723438	32.46	Pk	34.7	-95.2	-21.66	-49.7	-13	-36.70	H
7.629844	31.39	Pk	35.6	-95.2	-17.86	-46.07	-13	-33.07	V
7.632188	32.52	Pk	35.6	-95.2	-17.83	-44.91	-13	-31.91	H

HSDPA MODE

Project #:	4790592262
Date:	03/1/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	HSDPA Band 2
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1852.4MHz									
3.705469	36.57	Pk	33.0	-95.2	-25.11	-50.74	-13	-37.74	H
3.705469	37.05	Pk	33.0	-95.2	-25.11	-50.26	-13	-37.26	V
5.558438	35.04	Pk	34.7	-95.2	-21.37	-46.83	-13	-33.83	H
5.558438	32.60	Pk	34.7	-95.2	-21.37	-49.27	-13	-36.27	V
7.411406	32.50	Pk	35.5	-95.2	-18.63	-45.83	-13	-32.83	H
7.411406	32.91	Pk	35.5	-95.2	-18.63	-45.42	-13	-32.42	V
Mid Channel, 1880MHz									
3.759844	37.46	Pk	32.9	-95.2	-24.86	-49.70	-13	-36.70	H
3.759844	35.97	Pk	32.9	-95.2	-24.86	-51.19	-13	-38.19	V
5.640000	32.95	Pk	34.6	-95.2	-20.72	-48.37	-13	-35.37	H
5.640000	33.86	Pk	34.6	-95.2	-20.72	-47.46	-13	-34.46	V
7.520156	31.64	Pk	35.4	-95.2	-18.64	-46.80	-13	-33.80	H
7.520156	32.72	Pk	35.4	-95.2	-18.64	-45.72	-13	-32.72	V
High Channel, 1907.6MHz									
3.814219	37.08	Pk	33.0	-95.2	-25.09	-50.21	-13	-37.21	V
3.815156	38.20	Pk	32.9	-95.2	-25.11	-49.21	-13	-36.21	H
5.723438	32.71	Pk	34.7	-95.2	-21.66	-49.45	-13	-36.45	H
5.723438	33.89	Pk	34.7	-95.2	-21.66	-48.27	-13	-35.27	V
7.630313	31.73	Pk	35.6	-95.2	-17.85	-45.72	-13	-32.72	H
7.630313	30.83	Pk	35.6	-95.2	-17.85	-46.62	-13	-33.62	V

10.4.3. WCDMA BAND 4

REL 99 MODE

Project #:	4790592262
Date:	03/2/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	REL 99 Band 4
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.42375	36.46	Pk	32.6	-95.2	-25.83	-51.97	-13	-38.97	H
3.424688	36.32	Pk	32.6	-95.2	-25.78	-52.06	-13	-39.06	V
5.137031	34.92	Pk	34.4	-95.2	-22.48	-48.36	-13	-35.36	V
5.137500	35.08	Pk	34.4	-95.2	-22.50	-48.22	-13	-35.22	H
6.850781	32.16	Pk	35.5	-95.2	-19.91	-47.45	-13	-34.45	V
6.85125	33.35	Pk	35.5	-95.2	-19.92	-46.27	-13	-33.27	H
Mid Channel, 1732.6MHz									
3.465469	34.99	Pk	32.5	-95.2	-25.37	-53.08	-13	-40.08	H
3.465938	35.12	Pk	32.5	-95.2	-25.38	-52.96	-13	-39.96	V
5.198906	34.54	Pk	34.5	-95.2	-23.02	-49.18	-13	-36.18	H
5.198906	33.76	Pk	34.5	-95.2	-23.02	-49.96	-13	-36.96	V
6.929531	32.98	Pk	35.5	-95.2	-19.59	-46.31	-13	-33.31	V
6.930938	33.79	Pk	35.5	-95.2	-19.55	-45.46	-13	-32.46	H
High Channel, 1752.61MHz									
3.505781	34.22	Pk	32.5	-95.2	-24.38	-52.86	-13	-39.86	H
3.505781	36.19	Pk	32.5	-95.2	-24.38	-50.89	-13	-37.89	V
5.257969	34.28	Pk	34.6	-95.2	-22.32	-48.64	-13	-35.64	V
5.258438	32.4	Pk	34.6	-95.2	-22.31	-50.51	-13	-37.51	H
7.010625	33.02	Pk	35.5	-95.2	-18.79	-45.47	-13	-32.47	V
7.011563	32.26	Pk	35.5	-95.2	-18.79	-46.23	-13	-33.23	H

HSDPA MODE

Project #:	4790592262
Date:	02/2/2023
Test Engineer:	45258
Configuration:	EUT Only
Mode:	HSDPA Band 4
Chamber #:	01-RDE-A

Frequency (GHz)	Meter Reading (dBuV)	Det	Horn Antenna ACF(dB)	EIRP CF	Gain/Loss (dB)	Corrected Reading (dBm)	LIMIT	Margin (dB)	Polarity
Low Channel, 1712.4MHz									
3.424688	34.93	Pk	32.6	-95.2	-25.78	-53.45	-13	-40.45	H
3.424688	36.57	Pk	32.6	-95.2	-25.78	-51.81	-13	-38.81	V
5.134688	36.54	Pk	34.4	-95.2	-22.44	-46.70	-13	-33.70	H
5.137031	33.90	Pk	34.4	-95.2	-22.48	-49.38	-13	-36.38	V
6.846563	31.62	Pk	35.5	-95.2	-19.85	-47.93	-13	-34.93	V
6.847500	32.6	Pk	35.5	-95.2	-19.86	-46.96	-13	-33.96	H
Mid Channel, 1732.6MHz									
3.465000	34.41	Pk	32.5	-95.2	-25.36	-53.65	-13	-40.65	H
3.465000	34.84	Pk	32.5	-95.2	-25.36	-53.22	-13	-40.22	V
5.199375	35.23	Pk	34.5	-95.2	-23	-48.47	-13	-35.47	V
5.199844	33.41	Pk	34.5	-95.2	-22.98	-50.27	-13	-37.27	H
6.930000	32.74	Pk	35.5	-95.2	-19.59	-46.55	-13	-33.55	V
6.930469	33.17	Pk	35.5	-95.2	-19.57	-46.10	-13	-33.10	H
High Channel, 1752.61MHz									
3.505781	34.13	Pk	32.5	-95.2	-24.38	-52.95	-13	-39.95	H
3.506250	34.36	Pk	32.5	-95.2	-24.37	-52.71	-13	-39.71	V
5.257500	34.27	Pk	34.6	-95.2	-22.35	-48.68	-13	-35.68	H
5.258906	33.45	Pk	34.6	-95.2	-22.29	-49.44	-13	-36.44	V
7.010156	31.69	Pk	35.5	-95.2	-18.8	-46.81	-13	-33.81	H
7.011094	31.70	Pk	35.5	-95.2	-18.78	-46.78	-13	-33.78	V

11. SETUP PHOTOS

Please refer to 14523744-EP1V1 Setup Photo Report for setup photos.

END OF REPORT