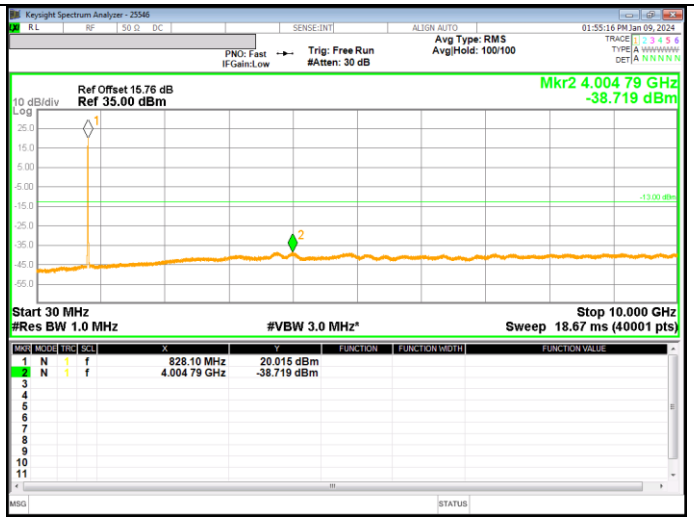
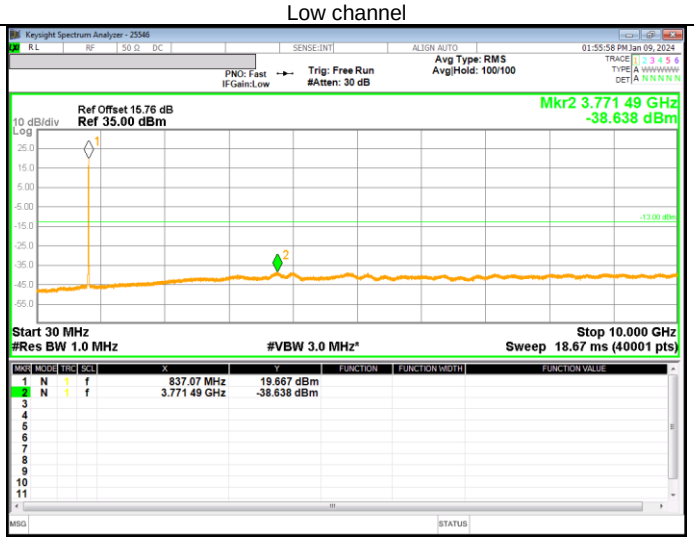
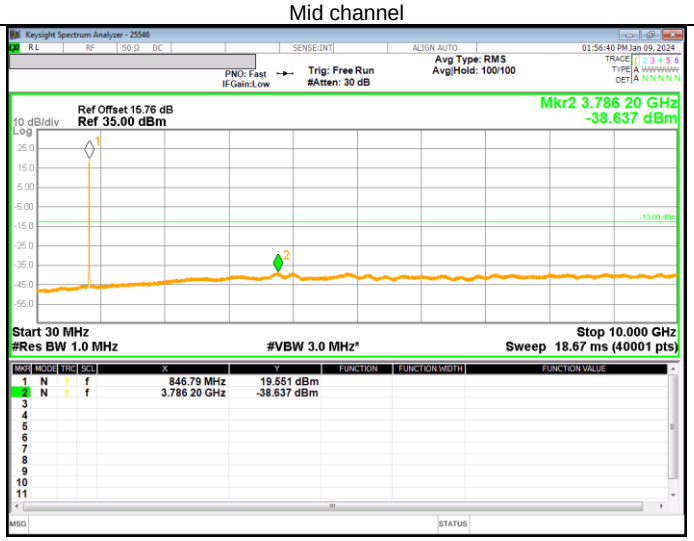
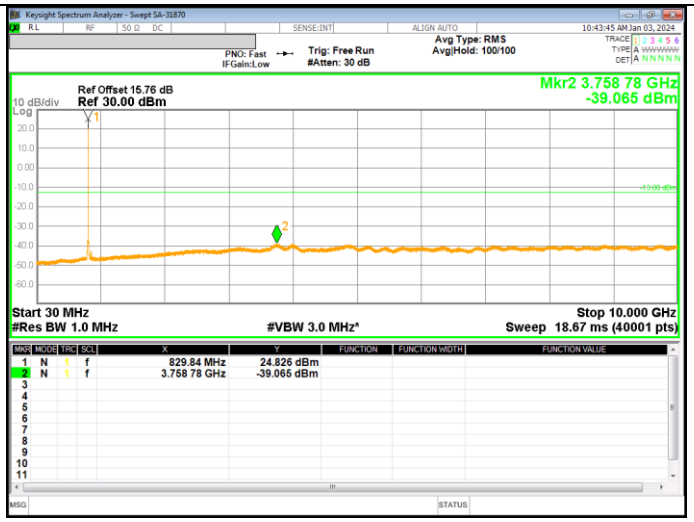
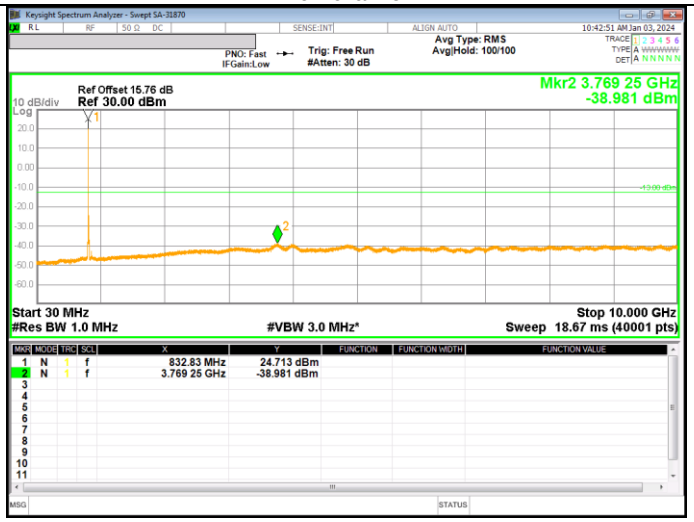
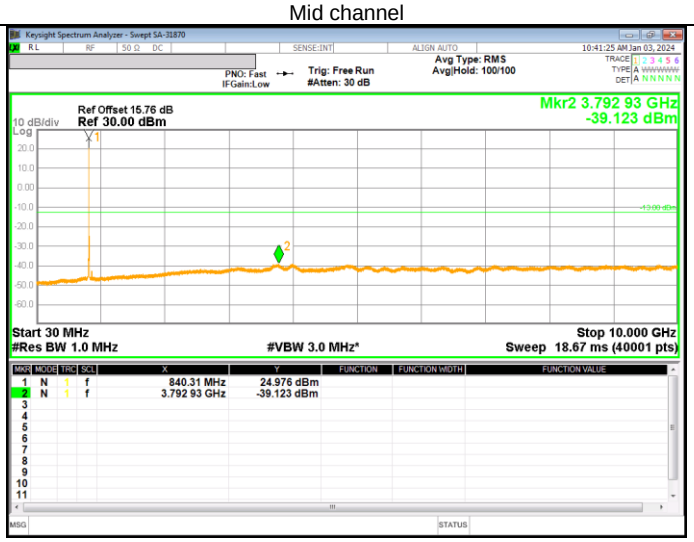
WCDMA Band 5

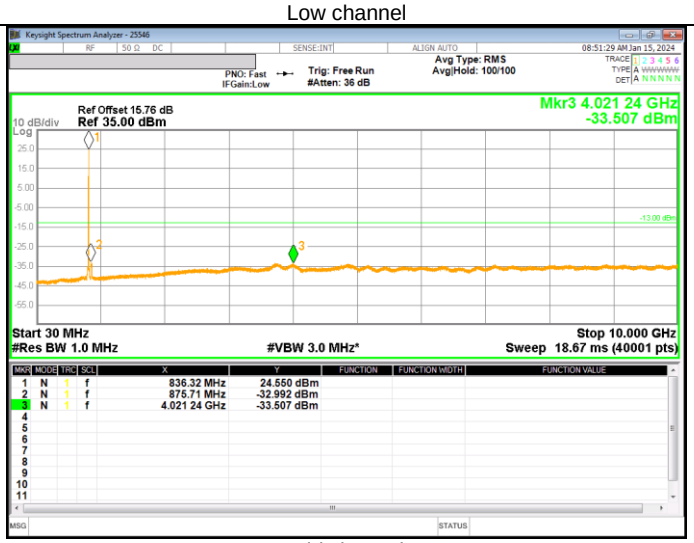
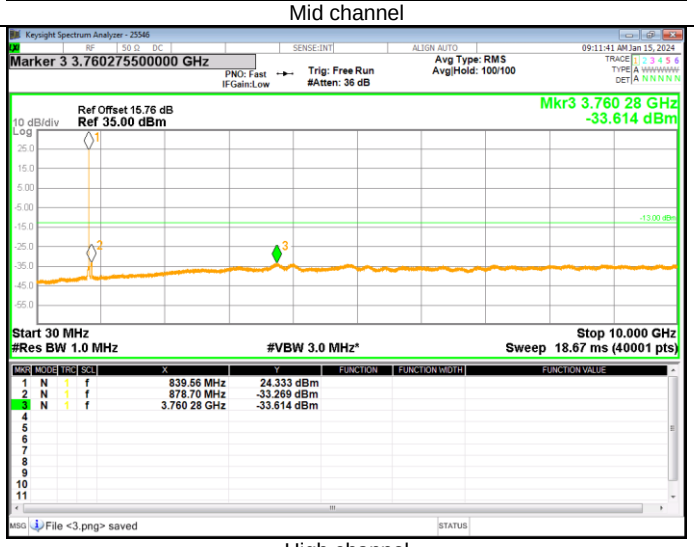
REL 99
 Low channel
 Mid channel
 High channel

LTE Band 5

10MHz QPSK
 Low channel
 Mid channel
 High channel

NR Band n5

20MHz BPSK_DFT-s_OFDM

Low channel

Mid channel

High channel

8.6. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055, §22.355

LIMITS

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

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

NOTE

Test were performed each lowest or highest frequency on the modulation condition of more wide bandwidth.(Please refer to section 9.1.1 OBW results)

RESULTS

See the following pages.

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8.6.1. FREQUENCY STABILITY RESULTS

GSM 850, Channel 128/251, Frequency 824.2/848.8 MHz

Test Date	2024-01-02
Test Engineer	25546

Reference Frequency : GSM850 Low Channel 824.2 MHz / High Channel 848.8 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2060.500 Hz		High Channel	2122.000 Hz	
Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	50	824.20001162	-0.003	848.80000494	0.002	2.5
3.88	40	824.20000409	0.006	848.80000861	-0.003	2.5
3.88	30	824.20000716	0.002	848.80000420	0.003	2.5
3.88	***20***	***824.20000896***	***0.000***	***848.80000637***	***0.000***	***2.5***
3.88	10	824.20000916	0.000	848.80000880	-0.003	2.5
3.88	0	824.20001035	-0.002	848.80000665	0.000	2.5
3.88	-10	824.20000894	0.000	848.80001024	-0.005	2.5
3.88	-20	824.20000904	0.000	848.80000788	-0.002	2.5
3.88	-30	824.20000733	0.002	848.80000948	-0.004	2.5

Reference Frequency : GSM850 Low Channel 824.2 MHz / High Channel 848.8 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2060.500 Hz		High Channel	2122.000 Hz	
Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	***20***	**824.20000896**	***0***	**848.80000637**	***0***	***2.5***
4.45	20	824.20000992	-0.001	848.80000391	0.003	2.5
3.70	20	824.20000729	0.002	848.80000660	0.000	2.5

WCDMA Band 5

Test Date	2024-01-03
Test Engineer	25546

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2066.000 Hz		High Channel	2116.500 Hz	
Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	50	826.40000126	0.000	846.60000645	-0.006	2.5
3.88	40	826.40000417	-0.003	846.60000138	0.000	2.5
3.88	30	826.40000371	-0.003	846.60000398	-0.003	2.5
3.88	***20***	***826.40000136***	***0.000***	***846.60000131***	***0.000***	***2.5***
3.88	10	826.40000545	-0.005	846.60000628	-0.006	2.5
3.88	0	826.40000333	-0.002	846.60000365	-0.003	2.5
3.88	-10	826.40000451	-0.004	846.60000417	-0.003	2.5
3.88	-20	826.40000126	0.000	846.60000133	0.000	2.5
3.88	-30	826.40000233	-0.001	846.60000140	0.000	2.5

Reference Frequency : WCDMA Band 5 Low Channel 826.4 MHz / High Channel 846.6 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2066.000 Hz		High Channel	2116.500 Hz	
Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	***20***	**826.40000136**	***0***	**846.60000131**	***0***	***2.5***
4.45	20	826.40000142	0.000	846.60000450	-0.004	2.5
3.70	20	826.40000547	-0.005	846.60000274	-0.002	2.5

LTE Band 5

Test Date	2024-01-04
Test Engineer	25546

Reference Frequency : Low Channel 824.7 MHz / High Channel 848.3 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2061.750	Hz	High Channel	2120.750	Hz
Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	50	824.70000394	-0.001	848.30000354	0.002	2.5
3.88	40	824.70000429	-0.002	848.30000136	0.004	2.5
3.88	30	824.70000442	-0.002	848.30000247	0.003	2.5
3.88	***20***	***824.70000298***	***0.000***	***848.30000498***	***0.000***	***2.5***
3.88	10	824.70000359	-0.001	848.30000555	-0.001	2.5
3.88	0	824.70000533	-0.003	848.30000136	0.004	2.5
3.88	-10	824.70000126	0.002	848.30000241	0.003	2.5
3.88	-20	824.70000391	-0.001	848.30000116	0.005	2.5
3.88	-30	824.70000437	-0.002	848.30000224	0.003	2.5

Reference Frequency : Low Channel 824.7 MHz / High Channel 848.3 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2061.750	Hz	High Channel	2120.750	Hz
Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	***20***	**824.70000298**	***0***	**848.30000498**	***0***	***2.5***
4.45	20	824.70000126	0.002	848.30000312	0.002	2.5
3.70	20	824.70000439	-0.002	848.30000541	-0.001	2.5

NR Band n5

Test Date	2024-01-08
Test Engineer	25546

Reference Frequency : Low Channel 826.5 MHz / High Channel 846.5 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2066.250	Hz	High Channel	2116.250	Hz
Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	50	826.50000556	0.001	846.50000312	0.001	2.5
3.88	40	826.50000315	0.004	846.50000126	0.004	2.5
3.88	30	826.50000452	0.003	846.50000364	0.001	2.5
3.88	***20***	***826.50000678***	***0.000***	***846.50000426***	***0.000***	***2.5***
3.88	10	826.50000321	0.004	846.50000541	-0.001	2.5
3.88	0	826.50000136	0.007	846.50000415	0.000	2.5
3.88	-10	826.50000247	0.005	846.50000332	0.001	2.5
3.88	-20	826.50000513	0.002	846.50000247	0.002	2.5
3.88	-30	826.50000497	0.002	846.50000165	0.003	2.5

Reference Frequency : Low Channel 826.5 MHz / High Channel 846.5 MHz @ 20ºC						
Limit: +- 2.5 ppm =	Low Channel	2066.250	Hz	High Channel	2116.250	Hz
Power Supply [Vdc]	Environment Temperature [ºC]	Frequency Deviation Measureed with Time Elapse				Limit [ppm]
		Low Channel		High Channel		
		[MHz]	Delta [ppm]	[MHz]	Delta [ppm]	
3.88	***20***	**826.50000678**	***0***	**846.50000426**	***0***	***2.5***
4.45	20	826.50000513	0.002	846.50000239	0.002	2.5
3.70	20	826.50000426	0.003	846.50000334	0.001	2.5

9. RADIATED RESULTS

9.1. RADIATED POWER (ERP)

RULE PART(S)

FCC: §2.1046, §22.913,

LIMITS

22.913(a) - The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

In addition, when the transmitter power is measured in terms of average value, the peak-to-average ratio of the power shall not exceed 13dB.

TEST PROCEDURE

ANSI / TIA / EIA 603 E Clause 2.2.17; ESU40 setting reference to 971168 D01 v03r01

For radiated output power measurement with a ESU40:

a) Set the RBW ≥ OBW;
b) Set VBW ≥ 3 × RBW;
c) Set span ≥ 2 x RBW;
d) Sweep time = auto couple or 1 second;
e) Detector = rms;
f) Ensure that the number of measurement points ≥ span/RBW;
g) Trace mode = max hold(GSM, WCDMA), average(LTE, 5G NR);

TEST RESULTS

See the following pages.

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218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

9.1.1. ERP Results

GSM (Antenna A, Main 1)

Band	Mode	Frequency (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	ERP (mW)	Limit (dBm)	Delta (dB)
GSM 850	GPRS	824.20	34.52	V	3.01	-1.03	30.48	1116.86	38.50	-8.02
		836.60	35.00	V	3.03	-0.97	31.01	1261.83	38.50	-7.49
		848.80	34.45	V	3.05	-0.91	30.49	1119.44	38.50	-8.01
	EGPRS	824.20	29.67	V	3.01	-1.03	25.63	365.59	38.50	-12.87
		836.60	30.36	V	3.03	-0.97	26.37	433.51	38.50	-12.13
		848.80	30.01	V	3.05	-0.91	26.05	402.72	38.50	-12.45

WCDMA (Antenna A, Main 1)

Band	Mode	Frequency (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	ERP (mW)	Limit (dBm)	Delta (dB)
Band 5	REL99	826.40	23.28	V	3.01	-1.02	19.25	84.14	38.50	-19.25
		836.60	24.37	V	3.03	-0.97	20.38	109.14	38.50	-18.12
		846.60	24.33	V	3.05	-0.92	20.36	108.64	38.50	-18.14
	HSDPA	826.40	22.55	V	3.01	-1.02	18.52	71.12	38.50	-19.98
		836.60	23.28	V	3.03	-0.97	19.29	84.92	38.50	-19.21
		846.60	23.15	V	3.05	-0.92	19.18	82.79	38.50	-19.32

LTE Band 5 (Antenna A, Main 1)

BW (MHz)	Modulation	Frequency (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	ERP (mW)	Limit (dBm)	Delta (dB)	RB
10	QPSK	829.00	23.79	V	3.02	-1.01	19.76	94.62	38.50	-18.74	1/25
		836.50	24.27	V	3.03	-0.97	20.27	106.41	38.50	-18.23	1/0
		844.00	23.91	V	3.04	-0.93	19.94	98.63	38.50	-18.56	1/0
	16-QAM	829.00	22.81	V	3.02	-1.01	18.78	75.51	38.50	-19.72	1/0
		836.50	23.12	V	3.03	-0.97	19.12	81.66	38.50	-19.38	1/0
		844.00	22.66	V	3.04	-0.93	18.69	73.96	38.50	-19.81	1/0
5	QPSK	826.50	23.28	V	3.01	-1.02	19.25	84.14	38.50	-19.25	1/24
		836.50	24.21	V	3.03	-0.97	20.21	104.95	38.50	-18.29	1/0
		846.50	23.78	V	3.05	-0.92	19.81	95.72	38.50	-18.69	1/0
	16-QAM	826.50	22.48	V	3.01	-1.02	18.45	69.98	38.50	-20.05	1/0
		836.50	22.95	V	3.03	-0.97	18.95	78.52	38.50	-19.55	1/0
		846.50	22.44	V	3.05	-0.92	18.47	70.31	38.50	-20.03	1/0
3	QPSK	825.50	23.26	V	3.01	-1.02	19.22	83.56	38.50	-19.28	1/14
		836.50	24.17	V	3.03	-0.97	20.17	103.99	38.50	-18.33	1/0
		847.50	23.89	V	3.05	-0.91	19.93	98.40	38.50	-18.57	1/0
	16-QAM	825.50	22.21	V	3.01	-1.02	18.17	65.61	38.50	-20.33	1/0
		836.50	22.92	V	3.03	-0.97	18.92	77.98	38.50	-19.58	1/14
		847.50	22.38	V	3.05	-0.91	18.42	69.50	38.50	-20.08	1/0
1.4	QPSK	824.70	23.07	V	3.01	-1.03	19.03	79.98	38.50	-19.47	1/0
		836.50	24.24	V	3.03	-0.97	20.24	105.68	38.50	-18.26	1/0
		848.30	23.91	V	3.05	-0.91	19.95	98.86	38.50	-18.55	1/0
	16-QAM	824.70	22.22	V	3.01	-1.03	18.18	65.77	38.50	-20.32	1/3
		836.50	22.80	V	3.03	-0.97	18.80	75.86	38.50	-19.70	1/3
		848.30	22.35	V	3.05	-0.91	18.39	69.02	38.50	-20.11	1/3

NR Band n5 (DFT-OFDM) (Antenna A, Main 1)

BW (MHz)	Modulation	Frequency (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBd)	ERP (dBm)	ERP (mW)	Limit (dBm)	Delta (dB)	RB
20	BPSK	834.00	22.71	V	3.03	-0.98	18.70	74.13	38.50	-19.80	1/53
		836.50	22.75	V	3.03	-0.97	18.75	74.99	38.50	-19.75	1/53
		839.00	22.53	V	3.03	-0.96	18.54	71.45	38.50	-19.96	1/53
	16-QAM	834.00	22.25	V	3.03	-0.98	18.24	66.68	38.50	-20.26	1/53
		836.50	22.20	V	3.03	-0.97	18.20	66.07	38.50	-20.30	1/53
		839.00	22.07	V	3.03	-0.96	18.08	64.27	38.50	-20.42	1/53
15	BPSK	831.50	22.52	V	3.02	-0.99	18.50	70.79	38.50	-20.00	1/77
		836.50	22.63	V	3.03	-0.97	18.63	72.95	38.50	-19.87	1/1
		841.50	22.43	V	3.04	-0.94	18.45	69.98	38.50	-20.05	1/1
	16-QAM	831.50	22.08	V	3.02	-0.99	18.06	63.97	38.50	-20.44	1/77
		836.50	22.25	V	3.03	-0.97	18.25	66.63	38.50	-20.25	1/1
		841.50	21.76	V	3.04	-0.94	17.78	59.98	38.50	-20.72	1/1
10	BPSK	829.00	22.04	V	3.02	-1.01	18.01	63.24	38.50	-20.49	1/26
		836.50	22.52	V	3.03	-0.97	18.52	71.12	38.50	-19.98	1/26
		844.00	21.72	V	3.04	-0.93	17.75	59.57	38.50	-20.75	1/26
	16-QAM	829.00	21.65	V	3.02	-1.01	17.62	57.81	38.50	-20.88	1/26
		836.50	22.03	V	3.03	-0.97	18.03	63.53	38.50	-20.47	1/50
		844.00	21.21	V	3.04	-0.93	17.24	52.97	38.50	-21.26	1/26
5	BPSK	826.50	21.93	V	3.01	-1.02	17.90	61.66	38.50	-20.60	1/23
		836.50	22.67	V	3.03	-0.97	18.67	73.62	38.50	-19.83	1/23
		846.50	22.33	V	3.05	-0.92	18.36	68.55	38.50	-20.14	1/1
	16-QAM	826.50	21.49	V	3.01	-1.02	17.46	55.72	38.50	-21.04	1/1
		836.50	22.18	V	3.03	-0.97	18.18	65.77	38.50	-20.32	1/1
		846.50	21.71	V	3.05	-0.92	17.74	59.43	38.50	-20.76	1/1

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218 Maeyeong-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16675, Korea TEL: (031) 337-9902 FAX: (031) 213-5433

9.2. RADIATIED SPURIOUS EMISSION

RULE PART(S)

FCC: §2.1053, §22.917

LIMIT

Part 22.917(a)
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.

TEST PROCEDURE

ANSI / TIA / EIA 603 E Clause 2.2.12; ESU40 setting reference to 971168 D01 v03r01

For peak power measurement with a ESU40:

a) Set the RBW = 100 kHz for emission below 1 GHz.
b) Set VBW ≥ 3 × RBW;
c) Set span ≥ 1.5 times the OBW;
d) Sweep time = auto couple;
e) Detector = rms;
f) Ensure that the number of measurement points ≥ span/RBW;
g) Trace mode = average(WCDMA, LTE, 5G NR), Maxhold(GSM);

NOTE1

5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations (π/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM) were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

NOTE2

Please refer to section 5.4 for bandwidth and RB setting about LTE, 5G NR bands.

RESULTS

See the following pages.

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9.2.1. SPURIOUS RADIATION PLOTS

GSM850

GPRS

Antenna A
Main 1

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company:	Samsung
Project #:	4791083081
Date:	2023-12-21
Test Engineer:	28775
Configuration:	EUT, Z-Position
Location:	Chamber 1
Mode:	GPRS 850 MHz Harmonics
Test Votage:	AC 120 V, 60 Hz

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 824.2MHz									
1648.40	-9.6	V	3.0	43.3	1.0	-51.9	-13.0	-38.9	
2472.60	-1.5	V	3.0	43.6	1.0	-44.1	-13.0	-31.1	
3296.80	-5.2	V	3.0	43.9	1.0	-48.1	-13.0	-35.1	
4121.00	-5.4	V	3.0	44.3	1.0	-48.7	-13.0	-35.7	
4945.20	-4.3	V	3.0	44.7	1.0	-48.1	-13.0	-35.1	
1648.40	-10.6	H	3.0	43.3	1.0	-52.9	-13.0	-39.9	
2472.60	-2.7	H	3.0	43.6	1.0	-45.3	-13.0	-32.3	
3296.80	-4.5	H	3.0	43.9	1.0	-47.4	-13.0	-34.4	
4121.00	-5.1	H	3.0	44.3	1.0	-48.5	-13.0	-35.5	
4945.20	-4.5	H	3.0	44.7	1.0	-48.2	-13.0	-35.2	
Mid Ch, 836.6MHz									
1673.20	-11.0	V	3.0	43.3	1.0	-53.3	-13.0	-40.3	
2509.80	-3.9	V	3.0	43.6	1.0	-46.5	-13.0	-33.5	
3346.40	-6.4	V	3.0	43.9	1.0	-49.4	-13.0	-36.4	
4183.00	-6.9	V	3.0	44.3	1.0	-50.2	-13.0	-37.2	
5019.60	-5.8	V	3.0	44.8	1.0	-49.6	-13.0	-36.6	
1673.20	-12.2	H	3.0	43.3	1.0	-54.5	-13.0	-41.5	
2509.80	-4.5	H	3.0	43.6	1.0	-47.1	-13.0	-34.1	
3346.40	-2.9	H	3.0	43.9	1.0	-45.8	-13.0	-32.8	
4183.00	-6.5	H	3.0	44.3	1.0	-49.9	-13.0	-36.9	
5019.60	-5.9	H	3.0	44.8	1.0	-49.7	-13.0	-36.7	
High Ch, 848.8MHz									
1697.60	-10.2	V	3.0	43.3	1.0	-52.5	-13.0	-39.5	
2546.40	-0.3	V	3.0	43.6	1.0	-42.9	-13.0	-29.9	
3395.20	-6.8	V	3.0	44.0	1.0	-49.8	-13.0	-36.8	
4244.00	-6.8	V	3.0	44.4	1.0	-50.2	-13.0	-37.2	
5092.80	-5.9	V	3.0	44.8	1.0	-49.6	-13.0	-36.6	
1697.60	-11.5	H	3.0	43.3	1.0	-53.8	-13.0	-40.8	
2546.40	-4.4	H	3.0	43.6	1.0	-47.0	-13.0	-34.0	
3395.20	-3.9	H	3.0	44.0	1.0	-46.8	-13.0	-33.8	
4244.00	-4.4	H	3.0	44.4	1.0	-47.8	-13.0	-34.8	
5092.80	-5.8	H	3.0	44.8	1.0	-49.6	-13.0	-36.6	

WCDMA Band 5

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company:	Samsung
Project #:	4791083081
Date:	2023-12-22
Test Engineer:	28183
Configuration:	EUT / AC Adapter, Z-Position
Location:	Chamber 1
Mode:	Rel99 Band 5 Harmonics
Test Votage:	AC 120 V, 60 Hz

REL99

Antenna A
Main 1

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 826.4MHz									
1652.80	-14.9	V	3.0	43.3	1.0	-57.3	-13.0	-44.3	
2479.20	-11.7	V	3.0	43.6	1.0	-54.2	-13.0	-41.2	
3305.60	-9.2	V	3.0	43.9	1.0	-52.1	-13.0	-39.1	
1652.80	-16.2	H	3.0	43.3	1.0	-58.5	-13.0	-45.5	
2479.20	-12.0	H	3.0	43.6	1.0	-54.6	-13.0	-41.6	
3305.60	-9.0	H	3.0	43.9	1.0	-51.9	-13.0	-38.9	
Mid Ch, 836.6MHz									
1673.20	-14.4	V	3.0	43.3	1.0	-56.7	-13.0	-43.7	
2509.80	-11.7	V	3.0	43.6	1.0	-54.3	-13.0	-41.3	
3346.40	-8.9	V	3.0	43.9	1.0	-51.9	-13.0	-38.9	
1673.20	-15.0	H	3.0	43.3	1.0	-57.3	-13.0	-44.3	
2509.80	-11.8	H	3.0	43.6	1.0	-54.4	-13.0	-41.4	
3346.40	-8.7	H	3.0	43.9	1.0	-51.6	-13.0	-38.6	
High Ch, 846.6MHz									
1693.20	-14.7	V	3.0	43.3	1.0	-57.1	-13.0	-44.1	
2539.80	-11.5	V	3.0	43.6	1.0	-54.1	-13.0	-41.1	
3386.40	-8.6	V	3.0	44.0	1.0	-51.5	-13.0	-38.5	
1693.20	-15.9	H	3.0	43.3	1.0	-58.3	-13.0	-45.3	
2539.80	-11.9	H	3.0	43.6	1.0	-54.5	-13.0	-41.5	
3386.40	-8.3	H	3.0	44.0	1.0	-51.3	-13.0	-38.3	

LTE Band 5

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company: Samsung
Project #: 4791083081
Date: 2023-12-26
Test Engineer: 28775
Configuration: EUT / AC Adapter, Y-Position
Location: Chamber 2
Mode: LTE_QPSK Band 5 Harmonics, 10MHz Bandwidth
Test Votage: AC 120 V, 60 Hz

10 MHz

QPSK

Antenna A
Main 1

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 829MHz									
1658.00	-15.0	V	3.0	40.8	1.0	-54.8	-13.0	-41.8	
2487.00	-11.9	V	3.0	41.5	1.0	-52.3	-13.0	-39.3	
3316.00	-9.4	V	3.0	42.2	1.0	-50.6	-13.0	-37.6	
1658.00	-15.9	H	3.0	40.8	1.0	-55.8	-13.0	-42.8	
2487.00	-12.0	H	3.0	41.5	1.0	-52.4	-13.0	-39.4	
3316.00	-8.8	H	3.0	42.2	1.0	-50.0	-13.0	-37.0	
Mid Ch, 836.5MHz									
1673.00	-14.7	V	3.0	40.8	1.0	-54.5	-13.0	-41.5	
2509.50	-11.9	V	3.0	41.5	1.0	-52.4	-13.0	-39.4	
3346.00	-9.2	V	3.0	42.2	1.0	-50.4	-13.0	-37.4	
1673.00	-15.6	H	3.0	40.8	1.0	-55.4	-13.0	-42.4	
2509.50	-11.9	H	3.0	41.5	1.0	-52.4	-13.0	-39.4	
3346.00	-8.7	H	3.0	42.2	1.0	-49.9	-13.0	-36.9	
High Ch, 844MHz									
1688.00	-14.9	V	3.0	40.8	1.0	-54.7	-13.0	-41.7	
2532.00	-11.8	V	3.0	41.5	1.0	-52.3	-13.0	-39.3	
3376.00	-9.1	V	3.0	42.2	1.0	-50.3	-13.0	-37.3	
1688.00	-15.8	H	3.0	40.8	1.0	-55.6	-13.0	-42.6	
2532.00	-11.5	H	3.0	41.5	1.0	-52.0	-13.0	-39.0	
3376.00	-8.7	H	3.0	42.2	1.0	-49.9	-13.0	-36.9	

NR Band n5

20 MHz

DFT-OFDM

BPSK

Antenna A
Main 1

UL Verification Services, Inc.
Above 1GHz High Frequency Substitution Measurement

Company:	Samsung
Project #:	4791083081
Date:	2024-01-05
Test Engineer:	26460
Configuration:	EUT / AC Adapter, Z-Position
Location:	Chamber 1
Mode:	5G NR_BPSK NR n5 Harmonics, 20MHz Bandwidth
Test Votage:	AC 120 V, 60 Hz

f MHz	SG reading (dBm)	Ant. Pol. (H/V)	Distance (m)	Preamp (dB)	Filter (dB)	EIRP (dBm)	Limit (dBm)	Delta (dB)	Notes
Low Ch, 834MHz									
1668.00	-15.2	V	3.0	43.3	1.0	-57.5	-13.0	-44.5	
2502.00	-12.1	V	3.0	43.6	1.0	-54.7	-13.0	-41.7	
3336.00	-9.5	V	3.0	43.9	1.0	-52.4	-13.0	-39.4	
1668.00	-16.3	H	3.0	43.3	1.0	-58.6	-13.0	-45.6	
2502.00	-12.5	H	3.0	43.6	1.0	-55.1	-13.0	-42.1	
3336.00	-9.2	H	3.0	43.9	1.0	-52.1	-13.0	-39.1	
Mid Ch, 836.5MHz									
1673.00	-15.3	V	3.0	43.3	1.0	-57.6	-13.0	-44.6	
2509.50	-12.2	V	3.0	43.6	1.0	-54.7	-13.0	-41.7	
3346.00	-9.3	V	3.0	43.9	1.0	-52.3	-13.0	-39.3	
1673.00	-16.4	H	3.0	43.3	1.0	-58.8	-13.0	-45.8	
2509.50	-12.5	H	3.0	43.6	1.0	-55.1	-13.0	-42.1	
3346.00	-9.0	H	3.0	43.9	1.0	-52.0	-13.0	-39.0	
High Ch, 839MHz									
1678.00	-15.1	V	3.0	43.3	1.0	-57.5	-13.0	-44.5	
2517.00	-12.1	V	3.0	43.6	1.0	-54.7	-13.0	-41.7	
3356.00	-9.3	V	3.0	43.9	1.0	-52.2	-13.0	-39.2	
1678.00	-16.4	H	3.0	43.3	1.0	-58.7	-13.0	-45.7	
2517.00	-12.4	H	3.0	43.6	1.0	-55.0	-13.0	-42.0	
3356.00	-9.1	H	3.0	43.9	1.0	-52.0	-13.0	-39.0	

END OF REPORT

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