



9.3. OUT OF BAND EMISSIONS

RULE PART(S)

FCC: §2.1051, and §96.41(e)

LIMITS

The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.

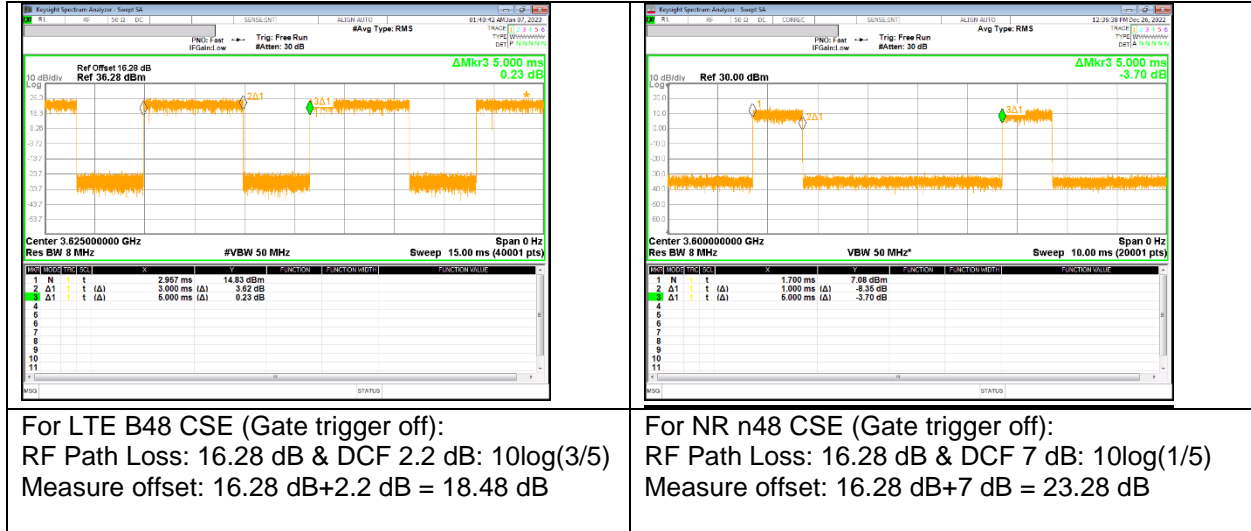
TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

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.

- a) Set the RBW = 100kHz for emission below 1GHz and 1MHz for emissions above 1GHz
A. (Tests were performed 1MHz [Worst case], to sweep 1 time for all frequency range)
- b) Set VBW $\geq 3 \times$ RBW
- c) Sweep time = auto couple;
- d) Detector = RMS;
- e) Ensure that the number of measurement points = Max (40001);
- f) Trace mode = Average(TDD);

NOTE1



For LTE B48 CSE (Gate trigger off):
 RF Path Loss: 16.28 dB & DCF 2.2 dB: $10\log(3/5)$
 Measure offset: 16.28 dB+2.2 dB = 18.48 dB

For NR n48 CSE (Gate trigger off):
 RF Path Loss: 16.28 dB & DCF 7 dB: $10\log(1/5)$
 Measure offset: 16.28 dB+7 dB = 23.28 dB

NOTE2

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

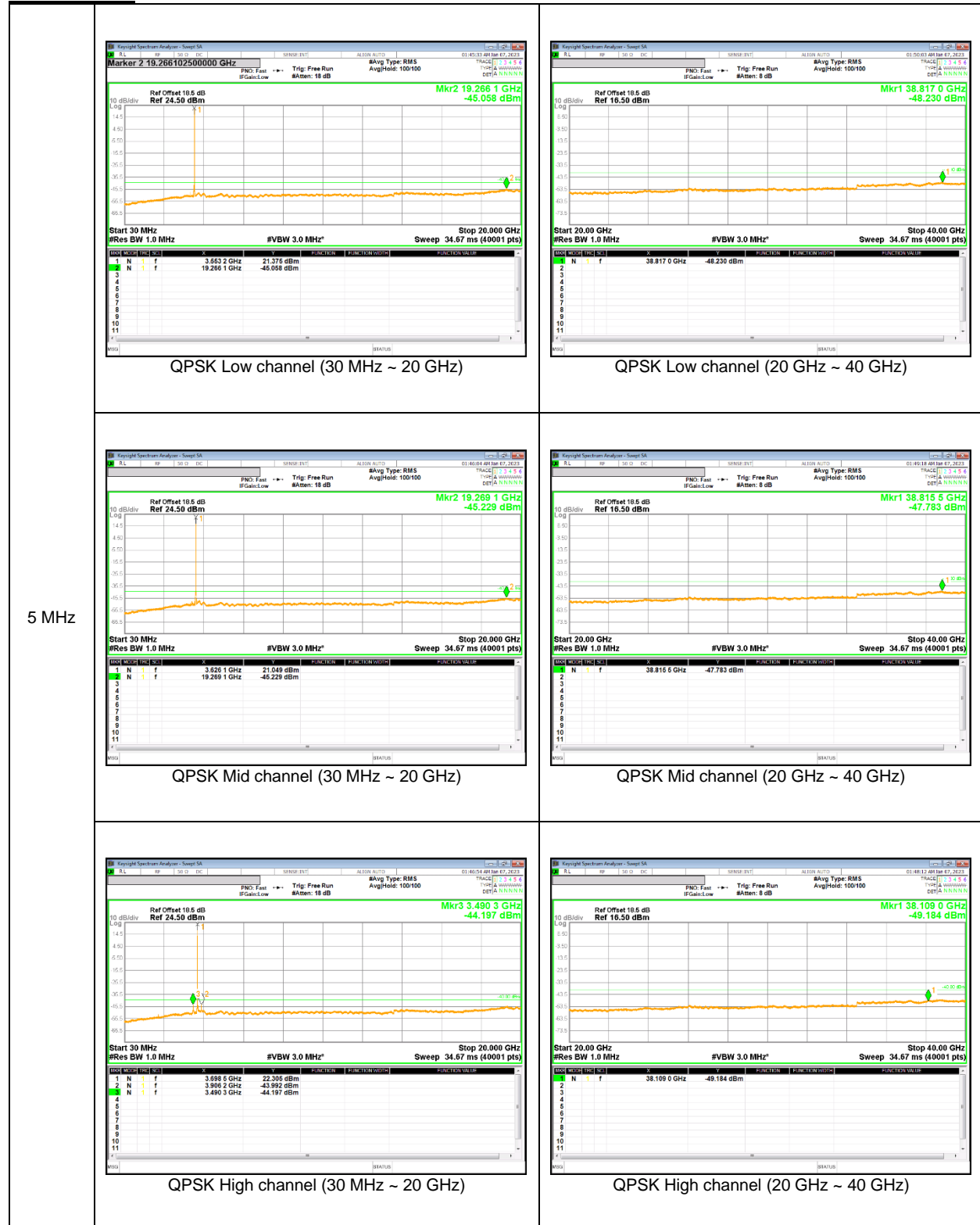
NOTE3

5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ 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.

RESULTS

See the following pages.

LTE Band 48



LTE Band 48(ULCA)



20+20
MHz

NR Band n48



40 MHz

9.4. FREQUENCY STABILITY

RULE PART(S)

FCC: §2.1055

LIMITS

For Part 96, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

Per KDB 971168 D01 Power Meas License Digital Systems v03r01

RESULTS

See the following pages.

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)

LTE Band 48(Lowest Frequency: 16QAM / Highest Frequency: 16QAM)

Test Date	2022-12-07
Test Engineer	19568

Limit		3550	3700	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	3550.2513	3699.7320	33.2	0.009
Extreme (50C)		3550.2513	3699.7320		
Extreme (40C)		3550.2513	3699.7320		
Extreme (30C)		3550.2513	3699.7320		
Extreme (10C)		3550.2513	3699.7320		
Extreme (0C)		3550.2513	3699.7320		
Extreme (-10C)		3550.2513	3699.7320		
Extreme (-20C)		3550.2513	3699.7320		
Extreme (-30C)		3550.2513	3699.7320		
20C		15%	3550.2513		
	-15%	3550.2513	3699.7320	32.7	0.009
	End Point	3550.2513	3699.7320	33.5	0.009

NR Band n48(Lowest Frequency: QPSK / Highest Frequency: QPSK)

Test Date	2022-12-09
Test Engineer	19568

Limit		3550	3700	Delta (Hz)	Frequency Stability (ppm)
Condition		F low @ End of OBW	F high @ End of OBW		
Temperature	Voltage	(MHz)	(MHz)		
Normal (20C)	Normal	3550.6976	3699.3048	20.4	0.006
Extreme (50C)		3550.6976	3699.3048		
Extreme (40C)		3550.6976	3699.3048		
Extreme (30C)		3550.6976	3699.3048		
Extreme (10C)		3550.6976	3699.3048		
Extreme (0C)		3550.6976	3699.3048		
Extreme (-10C)		3550.6976	3699.3048		
Extreme (-20C)		3550.6976	3699.3048		
Extreme (-30C)		3550.6976	3699.3048		
20C		15%	3550.6976		
	-15%	3550.6976	3699.3048	21.7	0.006
	End Point	3550.6976	3699.3048	19.5	0.005

9.5. END USER DEVICE(CBSD PROTOCOL)

RULE PART(S)

FCC: §96.47

LIMITS

End user devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation.

An end user device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.

TEST PROCEDURE

Per KDB 940660 D01 Part 96 CBRS Eqpt v03

RESULTS

Not performed.

Please refer to [LTE B48 & NR Band n48] CBSD test report.

9.6. RADIATED POWER (ERP & EIRP)

RULE PART(S)

FCC: §96.41(b)

LIMITS

FCC: §96.41(b)

(b) Unless otherwise specified in this section, the maximum effective isotropic radiated power (EIRP) and maximum Power Spectral Density (PSD) of any CBSD and End User Device must comply with the limits shown in the table.

Device	Maximum EIRP (dBm/10 megahertz)	Maximum PSD (dBm/MHz)
End User Device	23	n/a

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 \geq OBW;
- b) Set VBW $\geq 3 \times$ RBW;
- c) Set span $\geq 2 \times$ RBW;
- d) Sweep time = auto couple;
- e) Detector = rms;
- f) Ensure that the number of measurement points $\geq 2 \times$ span/RBW;
- g) Trace mode = Average;

TEST RESULTS

RF Output Power(total power) EIRP results meets Maximum EIRP limit (23 dBm/10MHz) of End User Device.

NOTE1

LTE Band 48 A-MPR is implemented in this EUT per the A-MPR specification in 3GPP TS 36.101 (Table 6.2.4-22). Conducted output power verification data are shown Appendix A. Also only Emission mask test item were performed A-MPR condition. Also only Emission mask test item were performed A-MPR condition

LTE Band 48C A-MPR is implemented in this EUT per the A-MPR specification in 3GPP TS 36.101 (Table 6.2.4A,10-1, Table 6.2.4A,10-2). Conducted output power verification data are shown Appendix A. Also only Emission mask test item were performed A-MPR condition. Also only Emission mask test item were performed A-MPR condition

NR Band n48 A-MPR is implemented in this EUT per the A-MPR specification in 3GPP TS 36.101 (Table 6.2.4-22). Conducted output power verification data are shown Appendix A. Also only Emission mask test item were performed A-MPR condition. Also only Emission mask test item were performed A-MPR condition

NOTE2

5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ 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.

RESULTS

See the following pages

9.6.1. ERP/EIRP Results

LTE Band 48

BW (MHz)	Modulation	f (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Delta (dB)	RB
5	QPSK	3552.50	17.43	H	6.40	10.76	21.79	151.01	23.00	-1.21	1/12
		3625.00	17.02	H	6.48	10.80	21.35	136.46	23.00	-1.65	1/12
		3697.50	17.21	H	6.54	10.75	21.42	138.68	23.00	-1.58	1/12
	16-QAM	3552.50	16.95	H	6.40	10.76	21.31	135.21	23.00	-1.69	1/12
		3625.00	16.69	H	6.48	10.80	21.02	126.47	23.00	-1.98	1/12
		3697.50	16.90	H	6.54	10.75	21.11	129.12	23.00	-1.89	1/12
10	QPSK	3555.00	17.23	H	6.41	10.76	21.59	144.21	23.00	-1.41	1/49
		3625.00	16.84	H	6.48	10.80	21.17	130.92	23.00	-1.83	1/0
		3695.00	17.30	H	6.54	10.76	21.52	141.91	23.00	-1.48	1/0
	16-QAM	3555.00	16.73	H	6.41	10.76	21.09	128.53	23.00	-1.91	1/49
		3625.00	16.36	H	6.48	10.80	20.69	117.22	23.00	-2.31	1/25
		3695.00	16.88	H	6.54	10.76	21.10	128.82	23.00	-1.90	1/25
15	QPSK	3557.50	17.42	H	6.40	10.77	21.78	150.66	23.00	-1.22	1/37
		3625.00	16.70	H	6.48	10.80	21.02	126.47	23.00	-1.98	1/37
		3692.50	16.64	H	6.53	10.76	20.86	121.90	23.00	-2.14	1/37
	16-QAM	3557.50	17.06	H	6.40	10.77	21.42	138.68	23.00	-1.58	1/37
		3625.00	16.22	H	6.48	10.80	20.55	113.50	23.00	-2.45	1/74
		3692.50	16.35	H	6.53	10.76	20.57	114.02	23.00	-2.43	1/37
20	QPSK	3560.00	17.27	H	6.41	10.77	21.63	145.51	23.00	-1.37	1/0
		3625.00	16.75	H	6.48	10.80	21.08	128.23	23.00	-1.92	1/99
		3690.00	17.14	H	6.53	10.76	21.37	137.09	23.00	-1.63	1/0
	16-QAM	3560.00	16.81	H	6.41	10.77	21.17	130.92	23.00	-1.83	1/0
		3625.00	16.53	H	6.48	10.80	20.86	121.90	23.00	-2.14	1/49
		3690.00	16.77	H	6.53	10.76	21.00	125.89	23.00	-2.00	1/99

NR Band n48

BW (MHz)	Modulation	f (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Delta (dB)	RB
10	QPSK	3555.00	14.70	H	6.41	10.76	19.05	80.35	23.00	-3.95	1/1
		3624.99	15.14	H	6.48	10.80	19.46	88.31	23.00	-3.54	1/1
		3694.98	17.70	H	6.54	10.76	21.91	155.24	23.00	-1.09	1/1
	16-QAM	3555.00	13.63	H	6.41	10.80	18.02	63.39	23.00	-4.98	1/1
		3624.99	14.30	H	6.48	10.73	18.55	71.61	23.00	-4.45	1/1
		3694.98	16.65	H	6.54	10.58	20.69	117.22	23.00	-2.31	1/1
15	QPSK	3575.52	16.05	H	6.40	10.77	20.41	109.90	23.00	-2.59	1/1
		3624.99	14.58	H	6.48	10.80	18.90	77.62	23.00	-4.10	1/1
		3692.49	17.69	H	6.53	10.76	21.92	155.60	23.00	-1.08	1/1
	16-QAM	3575.52	15.29	H	6.40	10.80	19.69	93.11	23.00	-3.31	1/1
		3624.99	13.45	H	6.48	10.73	17.70	58.88	23.00	-5.30	1/1
		3692.49	16.43	H	6.53	10.59	20.49	111.94	23.00	-2.51	1/1
20	QPSK	3560.00	16.51	H	6.41	10.80	20.90	123.03	23.00	-2.10	1/26
		3624.99	14.68	H	6.48	10.73	18.93	78.16	23.00	-4.07	1/26
		3690.00	16.67	H	6.53	10.59	20.73	118.30	23.00	-2.27	1/26
	16-QAM	3560.00	15.79	H	6.41	10.80	20.18	104.23	23.00	-2.82	1/26
		3624.00	14.27	H	6.48	10.73	18.52	71.12	23.00	-4.48	1/26
		3690.00	16.34	H	6.53	10.59	20.40	109.65	23.00	-2.60	1/26
40	QPSK	3570.00	16.22	H	6.41	10.80	20.60	114.82	23.00	-2.40	1/1
		3624.99	15.02	H	6.48	10.73	19.27	84.53	23.00	-3.73	1/53
		3679.98	17.16	H	6.52	10.61	21.25	133.35	23.00	-1.75	1/104
	16-QAM	3570.00	15.12	H	6.41	10.80	19.50	89.13	23.00	-3.50	1/1
		3624.99	14.20	H	6.48	10.73	18.45	69.98	23.00	-4.55	1/53
		3679.98	16.39	H	6.52	10.61	20.48	111.69	23.00	-2.52	1/104

LTE Band 48C(ULCA)

Part 96			
EIRP Limit (dBm)	23.0	ANT Gain (dBi)	-6.5

Frequency Range (MHz)	Bandwidth (MHz)	Modulation	Output Power				
			Conducted Average Power (dBm)	Antenna Gain (dBi)	EIRP Average Power		Margin
					dBm	mW	
3550 - 3700	40MHz (20+20)	QPSK	23.94	-6.5	17.44	55.46	-5.56
		16QAM	23.98		17.48	55.98	-5.52
	35MHz (15+20)	QPSK	23.81		17.31	53.83	-5.69
		16QAM	23.77		17.27	53.33	-5.73
	30MHz (10+20)	QPSK	23.63		17.13	51.64	-5.87
		16QAM	23.81		17.31	53.83	-5.69
	25MHz (5+20)	QPSK	23.59		17.09	51.17	-5.91
		16QAM	23.70		17.20	52.48	-5.8

NR Band n48(SRS1)

BW (MHz)	f (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Delta (dB)
10	3555.00								
	3624.99								
	3694.98								
15	3575.52								
	3624.99								
	3692.49								
20	3560.00	9.38	H	6.41	10.77	13.74	23.64	23.00	-9.26
	3624.99	11.05	H	6.48	10.80	15.38	34.53	23.00	-7.62
	3690.00	11.43	H	6.53	10.76	15.66	36.81	23.00	-7.34
40	3570.00								
	3624.99								
	3679.98								

NR Band n48(SRS2)

BW (MHz)	f (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Delta (dB)
10	3555.00								
	3624.99								
	3694.98								
15	3575.52								
	3624.99								
	3692.49								
20	3560.00	15.12	H	6.41	10.77	19.48	88.65	23.00	-3.52
	3624.99	13.15	H	6.48	10.80	17.48	56.00	23.00	-5.52
	3690.00	12.42	H	6.53	10.76	16.65	46.21	23.00	-6.35
40	3570.00								
	3624.99								
	3679.98								

NR Band n48(SRS3)

BW (MHz)	f (MHz)	SG reading (dBm)	Ant. Pol. (H/V)	Cable Loss (dB)	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Limit (dBm)	Delta (dB)
10	3555.00								
	3624.99								
	3694.98								
15	3575.52	6.61	H	6.40	10.77	10.98	12.52	23.00	-12.02
	3624.99	6.70	H	6.48	10.80	11.03	12.68	23.00	-11.97
	3692.49	6.91	H	6.53	10.76	11.13	12.98	23.00	-11.87
20	3560.00								
	3624.99								
	3690.00								
40	3570.00								
	3624.99								
	3679.98								

9.7. FIELD STRENGTH OF SPURIOUS RADIATION

RULE PART(S)

FCC: §2.1053 and §96.41(e)

LIMIT

The conducted power of any emissions below 3530 MHz or above 3720 MHz shall not exceed -40 dBm/MHz.

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 1GHz and 1MHz for emissions above 1GHz
- b) Set VBW $\geq 3 \times$ RBW;
- c) Sweep time = auto couple;
- d) Detector = rms;
- e) Ensure that the number of measurement points \geq span/RBW;
- f) Trace mode = Average;

RESULTS

See the following pages.

NOTE1

5G NR: All Waveforms (CP-OFDM vs DFT-s_OFDM) and modulations ($\pi/2$ 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 band.

9.7.1. SPURIOUS RADIATION PLOTS

LTE Band 48

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement										
		Company:	Samsung							
		Project #:	4790632299							
		Date:	2022-12-27							
		Test Engineer:	26087							
		Configuration:	EUT, Y-Position							
		Location:	Chamber 2							
		Mode:	LTE_QPSK Band 48 Harmonics, 5MHz Bandwidth							
		Test Voltage:	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, 3552.5MHz										
7105.00	-18.7	V	3.0	42.9	1.0	-60.6	-40.0	-20.6		
10657.50	-18.9	V	3.0	41.4	1.0	-59.3	-40.0	-19.3		
14210.00	-15.3	V	3.0	43.4	1.0	-57.7	-40.0	-17.7		
7105.00	-19.3	H	3.0	42.9	1.0	-61.2	-40.0	-21.2		
10657.50	-19.0	H	3.0	41.4	1.0	-59.4	-40.0	-19.4		
14210.00	-15.0	H	3.0	43.4	1.0	-57.4	-40.0	-17.4		
Mid Ch, 3625MHz										
7250.00	-8.0	V	3.0	42.8	1.0	-49.8	-40.0	-9.8		
10875.00	-18.3	V	3.0	41.5	1.0	-58.8	-40.0	-18.8		
14500.00	-15.7	V	3.0	43.6	1.0	-58.3	-40.0	-18.3		
7250.00	-7.8	H	3.0	42.8	1.0	-49.6	-40.0	-9.6		
10875.00	-18.2	H	3.0	41.5	1.0	-58.7	-40.0	-18.7		
14500.00	-15.2	H	3.0	43.6	1.0	-57.8	-40.0	-17.8		
High Ch, 3697.5MHz										
7395.00	-10.1	V	3.0	42.7	1.0	-51.8	-40.0	-11.8		
11092.50	-17.2	V	3.0	41.6	1.0	-57.7	-40.0	-17.7		
14790.00	-14.8	V	3.0	43.8	1.0	-57.6	-40.0	-17.6		
7395.00	-12.2	H	3.0	42.7	1.0	-53.9	-40.0	-13.9		
11092.50	-17.4	H	3.0	41.6	1.0	-58.0	-40.0	-18.0		
14790.00	-14.5	H	3.0	43.8	1.0	-57.2	-40.0	-17.2		

5MHz
QPSK

LTE Band 48(ULCA)

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
		Company:	Samsung						
		Project #:	4790632229						
		Date:	2023-01-04						
		Test Engineer:	26087						
		Configuration:	EUT / Z-Position						
		Location:	Chamber 2						
		Mode:	LTE_QPSK Band 48 Harmonics, 20+20MHz Bandwidth						
		Test Voltage:	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, PCC : 3560MHz SCC : 3579.8MHz									
20+20 MHz	7139.80	-13.2	V	3.0	42.9	1.0	-55.1	-40.0	-15.1
	10709.70	-18.2	V	3.0	41.4	1.0	-58.6	-40.0	-18.6
	14279.60	-15.6	V	3.0	43.5	1.0	-58.0	-40.0	-18.0
QPSK	7139.80	-12.5	H	3.0	42.9	1.0	-54.3	-40.0	-14.3
	10709.70	-18.4	H	3.0	41.4	1.0	-58.8	-40.0	-18.8
	14279.60	-15.4	H	3.0	43.5	1.0	-57.9	-40.0	-17.9
Mid Ch, PCC : 3615.1MHz SCC : 3634.9MHz									
	7250.00	-3.2	V	3.0	42.8	1.0	-45.0	-40.0	-5.0
	10875.00	-20.4	V	3.0	41.5	1.0	-60.9	-40.0	-20.9
	14500.00	-17.5	V	3.0	43.6	1.0	-60.1	-40.0	-20.1
	7250.00	-9.0	H	3.0	42.8	1.0	-50.8	-40.0	-10.8
	10875.00	-20.1	H	3.0	41.5	1.0	-60.6	-40.0	-20.6
	14500.00	-17.4	H	3.0	43.6	1.0	-60.0	-40.0	-20.0
High Ch, PCC : 3670.2MHz SCC : 3690MHz									
	7660.20	-21.2	V	3.0	42.6	1.0	-62.8	-40.0	-22.8
	11490.30	-17.7	V	3.0	41.7	1.0	-58.5	-40.0	-18.5
	15320.40	-15.4	V	3.0	43.8	1.0	-58.2	-40.0	-18.2
	7660.20	-21.0	H	3.0	42.6	1.0	-62.6	-40.0	-22.6
	11490.30	-17.5	H	3.0	41.7	1.0	-58.2	-40.0	-18.2
	15320.40	-15.1	H	3.0	43.8	1.0	-58.0	-40.0	-18.0

NR Band n48

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4790632299							
Date:		2023-01-03							
Test Engineer:		25770							
Configuration:		EUT, Z-Position							
Location:		Chamber 2							
Mode:		5G NR_QPSK NR n48 Harmonics, 15MHz Bandwidth							
Test Voltage:		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, 3557.5MHz									
7115.00	-14.9	V	3.0	42.9	1.0	-56.7	-40.0	-16.7	
10672.50	-18.7	V	3.0	41.4	1.0	-59.1	-40.0	-19.1	
14230.00	-15.5	V	3.0	43.4	1.0	-57.9	-40.0	-17.9	
7115.00	-14.8	H	3.0	42.9	1.0	-56.7	-40.0	-16.7	
10672.50	-18.7	H	3.0	41.4	1.0	-59.1	-40.0	-19.1	
14230.00	-15.3	H	3.0	43.4	1.0	-57.7	-40.0	-17.7	
Mid Ch, 3625MHz									
7250.00	-8.0	V	3.0	42.8	1.0	-49.8	-40.0	-9.8	
10875.00	-18.7	V	3.0	41.5	1.0	-59.2	-40.0	-19.2	
14500.00	-15.3	V	3.0	43.6	1.0	-57.9	-40.0	-17.9	
7250.00	-16.7	H	3.0	42.8	1.0	-58.5	-40.0	-18.5	
10875.00	-18.8	H	3.0	41.5	1.0	-59.3	-40.0	-19.3	
14500.00	-15.2	H	3.0	43.6	1.0	-57.8	-40.0	-17.8	
High Ch, 3692.5MHz									
7385.00	-11.6	V	3.0	42.7	1.0	-53.3	-40.0	-13.3	
11077.50	-17.4	V	3.0	41.6	1.0	-58.0	-40.0	-18.0	
14770.00	-14.8	V	3.0	43.8	1.0	-57.6	-40.0	-17.6	
7385.00	-13.3	H	3.0	42.7	1.0	-55.0	-40.0	-15.0	
11077.50	-17.6	H	3.0	41.6	1.0	-58.1	-40.0	-18.1	
14770.00	-14.6	H	3.0	43.8	1.0	-57.4	-40.0	-17.4	

15MHz
QPSK

NR Band n48(SRS1)

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company: Samsung Project #: 4790632299 Date: 2023-01-16 Test Engineer: 26087 Configuration: EUT / AC Adapter, Y-Position Location: Chamber 1 Mode: 5G NR_QPSK NR n48 Harmonics, 20MHz Bandwidth Test Voltage: 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
20MHz									
Low Ch, 3560MHz									
7120.00	-5.4	V	3.0	45.5	1.0	-49.9	-40.0	-9.9	
10680.00	-9.0	V	3.0	46.1	1.0	-54.1	-40.0	-14.1	
14240.00	-10.5	V	3.0	46.4	1.0	-55.9	-40.0	-15.9	
7120.00	-6.9	H	3.0	45.5	1.0	-51.4	-40.0	-11.4	
10680.00	-9.0	H	3.0	46.1	1.0	-54.1	-40.0	-14.1	
14240.00	-10.3	H	3.0	46.4	1.0	-55.8	-40.0	-15.8	
Mid Ch, 3625MHz									
7250.00	-4.6	V	3.0	45.5	1.0	-49.1	-40.0	-9.1	
10875.00	-8.7	V	3.0	46.3	1.0	-54.0	-40.0	-14.0	
14500.00	-11.7	V	3.0	46.3	1.0	-57.0	-40.0	-17.0	
7250.00	-6.5	H	3.0	45.5	1.0	-51.0	-40.0	-11.0	
10875.00	-8.5	H	3.0	46.3	1.0	-53.8	-40.0	-13.8	
14500.00	-11.8	H	3.0	46.3	1.0	-57.2	-40.0	-17.2	
High Ch, 3690MHz									
7380.00	-3.3	V	3.0	45.5	1.0	-47.8	-40.0	-7.8	
11070.00	-8.7	V	3.0	46.5	1.0	-54.2	-40.0	-14.2	
14760.00	-10.0	V	3.0	46.2	1.0	-55.3	-40.0	-15.3	
7380.00	-7.8	H	3.0	45.5	1.0	-52.4	-40.0	-12.4	
11070.00	-9.0	H	3.0	46.5	1.0	-54.5	-40.0	-14.5	
14760.00	-9.8	H	3.0	46.2	1.0	-55.0	-40.0	-15.0	

NR Band n48(SRS2)

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement									
Company:		Samsung							
Project #:		4790632299							
Date:		2023-01-13							
Test Engineer:		26087							
Configuration:		EUT, Y-Position							
Location:		Chamber 1							
Mode:		5G NR_QPSK NR n48 Harmonics, 20MHz Bandwidth							
Test Voltage:		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, 3560MHz									
7120.00	-8.3	V	3.0	45.5	1.0	-52.8	-40.0	-12.8	
10680.00	-5.9	V	3.0	46.1	1.0	-51.0	-40.0	-11.0	
14240.00	-10.5	V	3.0	46.4	1.0	-55.9	-40.0	-15.9	
7120.00	-6.1	H	3.0	45.5	1.0	-50.6	-40.0	-10.6	
10680.00	-5.9	H	3.0	46.1	1.0	-51.0	-40.0	-11.0	
14240.00	-10.6	H	3.0	46.4	1.0	-56.1	-40.0	-16.1	
Mid Ch, 3625MHz									
7250.00	-7.0	V	3.0	45.5	1.0	-51.5	-40.0	-11.5	
10875.00	-8.5	V	3.0	46.3	1.0	-53.8	-40.0	-13.8	
14500.00	-12.2	V	3.0	46.3	1.0	-57.5	-40.0	-17.5	
7250.00	-5.7	H	3.0	45.5	1.0	-50.2	-40.0	-10.2	
10875.00	-8.5	H	3.0	46.3	1.0	-53.8	-40.0	-13.8	
14500.00	-11.6	H	3.0	46.3	1.0	-57.0	-40.0	-17.0	
High Ch, 3690MHz									
7380.00	-9.5	V	3.0	45.5	1.0	-54.1	-40.0	-14.1	
11070.00	-8.6	V	3.0	46.5	1.0	-54.1	-40.0	-14.1	
14760.00	-10.2	V	3.0	46.2	1.0	-55.5	-40.0	-15.5	
7380.00	-7.3	H	3.0	45.5	1.0	-51.8	-40.0	-11.8	
11070.00	-8.3	H	3.0	46.5	1.0	-53.7	-40.0	-13.7	
14760.00	-10.3	H	3.0	46.2	1.0	-55.5	-40.0	-15.5	

10MHz

NR Band n48(SRS3)

UL Verification Services, Inc. Above 1GHz High Frequency Substitution Measurement											
10MHz		Company: Samsung Project #: 4790632299 Date: 2023-01-13 Test Engineer: 26087 Configuration: EUT / AC Adapter, X-Position Location: Chamber 1 Mode: 5G NR_QPSK NR n48 Harmonics, 15MHz Bandwidth Test Voltage: 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, 3557.5MHz									
		7115.00	-12.7	V	3.0	45.5	1.0	-57.2	-40.0	-17.2	
		10672.50	-8.1	V	3.0	46.1	1.0	-53.3	-40.0	-13.3	
		14230.00	-10.6	V	3.0	46.4	1.0	-56.1	-40.0	-16.1	
		7115.00	-12.7	H	3.0	45.5	1.0	-57.2	-40.0	-17.2	
10672.50	-8.8	H	3.0	46.1	1.0	-53.9	-40.0	-13.9			
14230.00	-10.3	H	3.0	46.4	1.0	-55.7	-40.0	-15.7			
Mid Ch, 3625MHz											
7250.00	-12.1	V	3.0	45.5	1.0	-56.6	-40.0	-16.6			
10875.00	-8.8	V	3.0	46.3	1.0	-54.1	-40.0	-14.1			
14500.00	-12.2	V	3.0	46.3	1.0	-57.5	-40.0	-17.5			
7250.00	-12.3	H	3.0	45.5	1.0	-56.8	-40.0	-16.8			
10875.00	-8.6	H	3.0	46.3	1.0	-53.9	-40.0	-13.9			
14500.00	-12.0	H	3.0	46.3	1.0	-57.4	-40.0	-17.4			
High Ch, 3692.5MHz											
7385.00	-12.1	V	3.0	45.5	1.0	-56.6	-40.0	-16.6			
11077.50	-8.5	V	3.0	46.5	1.0	-54.0	-40.0	-14.0			
14770.00	-10.2	V	3.0	46.2	1.0	-55.4	-40.0	-15.4			
7385.00	-12.0	H	3.0	45.5	1.0	-56.6	-40.0	-16.6			
11077.50	-8.9	H	3.0	46.5	1.0	-54.4	-40.0	-14.4			
14770.00	-10.1	H	3.0	46.2	1.0	-55.4	-40.0	-15.4			

END OF TEST REPORT