


**ELECTROMAGNETIC EMISSIONS
COMPLIANCE REPORT**

Applicant: Telit Communications S.p.A.
Via Stazione di Prosecco 5/b 34010 Sgonico - Trieste, Italy

Manufacturer: Telit Wireless Solutions. Co. Ltd.
13th Fl., Shinyoung Securities Bld, 6, Gukjegeumyung-ro 8-gil,
Yeongdeungpo-gu, Seoul, 07330, South Korea

Product Name: 5G Radio Module

Brand Name: Telit Cinterion or 

Model No.: FE910C04-WW

Family Model No.: FE910C04-WWD

Model Difference: FE910C04-WW and FE910C04-WWD are the same, except for that FE910C04-WWD is Data only module obtained by different SW configuration.

Report Number: TERF2503001151ER

FCC ID RI7FE910C04WW

Date of EUT Received: March 25, 2025

Date of Test: March 26, 2025~June 3, 2025

Issue Date: June 19, 2025

Approved By

**Jim Chang****We hereby certify that:**

The above equipment was tested by SGS Taiwan Ltd. Central RF Lab The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.26-2015 and the energy emitted by the sample EUT comply with FCC rule part 2, 22H & 24E & 27C & 90S.

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

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Revision History

Report Number	Revision	Description	Issue Date	Revised By	Remark
TERF2503001151ER	00	Original	June 19, 2025	Susan Lin	

Note:

- 1、The remark "" indicates modification of the report upon requests from certification body.
- 2、Variant information of model numbers is provided by the applicant, test results of this report are applicable to the sample EUT(s) received. And are assessed as electrically identical in RF characteristics, therefore, no further assessment required for the variant(s).

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1 GENERAL PRODUCT INFORMATION

1.1 Product Description

Product Name:	5G Radio Module
Brand Name:	Telit Cinterion or 
Model No.:	FE910C04-WW
Family Model No.:	FE910C04-WWD
Model Difference:	FE910C04-WW and FE910C04-WWD are the same, except for that FE910C04-WWD is Data only module obtained by different SW configuration.
Hardware Version:	1.00
Firmware Version:	M0V.031001
EUT Series No.:	355781700005719, 355781700007690
Power Supply:	3.8Vdc
Test Software (Name/Version):	Connected with Callbox

1.2 Operation Frequency Range

NR Band 2			
BW (MHz)	Operation Frequency (MHz)		
5	1852.5	-	1907.5
10	1855.0	-	1905.0
15	1857.5	-	1902.5
20	1860.0	-	1900.0

NR Band 7			
BW (MHz)	Operation Frequency (MHz)		
5	2502.5	-	2567.5
10	2505.0	-	2565.0
15	2507.5	-	2562.5
20	2510.0	-	2560.0

NR Band 5			
BW (MHz)	Operation Frequency (MHz)		
5	826.5	-	846.5
10	829.0	-	844.0
15	831.5	-	841.5
20	834.0	-	839.0

NR Band 12			
BW (MHz)	Operation Frequency (MHz)		
5	701.5	-	713.5
10	704.0	-	711.0
15	706.5	-	708.5

NR Band 13			
BW (MHz)	Operation Frequency (MHz)		
5	779.5	-	784.5
10	782	-	782

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NR Band 14			
BW (MHz)	Operation Frequency (MHz)		
5	790.5	-	795.5
10	793.0	-	793.0

NR Band 25			
BW (MHz)	Operation Frequency (MHz)		
5	1852.5	-	1912.5
10	1855.0	-	1910.0
15	1857.5	-	1907.5
20	1860.0	-	1905.0

NR Band 26 (Part 90)			
BW (MHz)	Operation Frequency (MHz)		
5	816.5	-	821.5
10	819.0	-	819.0

NR Band 26			
BW (MHz)	Operation Frequency (MHz)		
5	826.5	-	846.5
10	829.0	-	844.0
15	831.5	-	841.5
20	834.0	-	839.0

NR Band 30			
BW (MHz)	Operation Frequency (MHz)		
5	2307.5	-	2312.5
10	2310	-	2310

NR Band 38			
BW (MHz)	Operation Frequency (MHz)		
10	2575.0	-	2615.0
15	2577.5	-	2612.5
20	2580.0	-	2610.0

NR Band 41			
BW (MHz)	Operation Frequency (MHz)		
10	2501.0	-	2685.0
15	2503.5	-	2682.5
20	2506.0	-	2680.0

NR Band 66			
BW (MHz)	Operation Frequency (MHz)		
5	1712.5	-	1777.5
10	1715.0	-	1775.0
15	1717.5	-	1772.5
20	1720.0	-	1770.0

NR Band 70			
BW (MHz)	Operation Frequency (MHz)		
5	1697.5	-	1707.5
10	1700.0	-	1705.0
15	1702.5	-	1702.5

NR Band 71			
BW (MHz)	Operation Frequency (MHz)		
5	665.5	-	695.5
10	668.0	-	693.0
15	670.5	-	690.5
20	673.0	-	688.0

NR Band 77 (lower)			
BW (MHz)	Operation Frequency (MHz)		
10	3455.0	-	3545.0
15	3457.5	-	3542.5
20	3460.0	-	3540.0

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NR Band 77 (upper)			
BW (MHz)	Operation Frequency (MHz)		
10	3705.0	-	3975.0
15	3707.5	-	3972.5
20	3710.0	-	3970.0

NR Band 78 (lower)			
BW (MHz)	Operation Frequency (MHz)		
10	3455.0	-	3545.0
15	3457.5	-	3542.5
20	3460.0	-	3540.0

NR Band 78 (upper)			
BW (MHz)	Operation Frequency (MHz)		
10	3705.0	-	3795.0
15	3707.5	-	3792.5
20	3710.0	-	3790.0

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1.3 Antenna Designation

Antenna Type	Antenna Model No.
Monopole	TG.55.8113
Note: Transmission frequencies in this test report are only available by the above antenna(s).	

5G NR Band	Frequency (MHz)	Antenna Gain (dBi)	Insertion Loss (dB)	Final Gain (dBi)
n2	1850 ~ 1910	3.09	0.6	2.49
n5	824 ~ 849	0.58	0.3	0.28
n7	2500 ~ 2570	1.69	0.7	0.99
n12	699 ~ 716	-1.88	0.3	-2.18
n13	777~787	-1.88	0.3	-2.18
n14	788 ~ 798	-1.88	0.3	-2.18
n25	1850 ~ 1915	3.09	0.6	2.49
n26 Part 90s	814 ~ 824	-1.88	0.3	-2.18
n26	824 ~ 849	0.58	0.3	0.28
n30	2305 ~ 2315	1.69	0.7	0.99
n38	2570 ~ 2620	1.69	0.7	0.99
n41	2496 ~ 2690	1.69	0.7	0.99
n66	1710 ~ 1780	3.09	0.6	2.49
n70	1695 ~ 1710	3.09	0.6	2.49
n71	663 ~ 698	0.14	0.3	-0.16
n77(lower)	3450 ~ 3550	1.51	1.1	0.41
n77(upper)	3700 ~ 3980	1.51	1.1	0.41
n78(lower)	3450 ~ 3550	1.51	1.1	0.41
n78(upper)	3700 ~ 3800	1.51	1.1	0.41

Note: The antenna information is provided by the applicant, and the laboratory shall not be held liable for the accuracy, completeness, or reliability of any applicant-supplied data.

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1.4 Type of Emission & Max ERP/EIRP Power Measurement Result:

5G NR Band n2_Uplink frequency band : 1850 to 1910 MHz									
Bandwidth (MHz)	Lower Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
5	1852.5	1907.5	DFT-s PI/2 BPSK	22.38	24.87	0.307	4.5868	4586.8	4M59G7W
			DFT-s QPSK	22.32	24.81	0.303	4.5845	4584.5	4M58G7W
			DFT-s QAM	21.31	23.80	0.240	4.581	4581.0	4M58D7W
			CP QPSK	20.50	22.99	0.199	4.5845	4584.5	4M58G7W
			CP QAM	20.20	22.69	0.186	4.581	4581.0	4M58D7W
10	1855	1905	DFT-s PI/2 BPSK	22.31	24.80	0.302	8.9718	8971.8	8M97G7W
			DFT-s QPSK	22.30	24.79	0.301	9.0246	9024.6	9M02G7W
			DFT-s QAM	21.31	23.80	0.240	8.9893	8989.3	8M99D7W
			CP QPSK	21.03	23.52	0.225	9.0246	9024.6	9M02G7W
			CP QAM	20.19	22.68	0.185	8.9893	8989.3	8M99D7W
15	1857.5	1902.5	DFT-s PI/2 BPSK	22.68	25.17	0.329	13.444	13444.0	13M4G7W
			DFT-s QPSK	22.50	24.99	0.316	13.446	13446.0	13M4G7W
			DFT-s QAM	21.73	24.22	0.264	13.496	13496.0	13M5D7W
			CP QPSK	21.06	23.55	0.226	13.446	13446.0	13M4G7W
			CP QAM	20.35	22.84	0.192	13.496	13496.0	13M5D7W
20	1860	1900	DFT-s PI/2 BPSK	22.47	24.96	0.313	17.915	17915.0	17M9G7W
			DFT-s QPSK	22.42	24.91	0.310	17.944	17944.0	17M9G7W
			DFT-s QAM	21.64	24.13	0.259	17.94	17940.0	17M9D7W
			CP QPSK	21.13	23.62	0.230	17.944	17944.0	17M9G7W
			CP QAM	20.62	23.11	0.205	17.94	17940.0	17M9D7W
5G NR Band n5_Uplink frequency band : 824 to 849 MHz									
Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
5	826.5	846.5	DFT-s PI/2 BPSK	23.02	21.15	0.130	4.5527	4552.7	4M55G7W
			DFT-s QPSK	23.00	21.13	0.130	4.5561	4556.1	4M56G7W
			DFT-s QAM	21.92	20.05	0.101	4.5695	4569.5	4M57D7W
			CP QPSK	21.56	19.69	0.093	4.5561	4556.1	4M56G7W
			CP QAM	21.02	19.15	0.082	4.5695	4569.5	4M57D7W
10	829	844	DFT-s PI/2 BPSK	22.89	21.02	0.126	8.9698	8969.8	8M97G7W
			DFT-s QPSK	22.85	20.98	0.125	9.0026	9002.6	9M00G7W
			DFT-s QAM	21.91	20.04	0.101	9.0082	9008.2	9M01D7W
			CP QPSK	21.56	19.69	0.093	9.0026	9002.6	9M00G7W
			CP QAM	20.83	18.96	0.079	9.0082	9008.2	9M01D7W
15	831.5	841.5	DFT-s PI/2 BPSK	23.08	21.21	0.132	13.428	13428.0	13M4G7W
			DFT-s QPSK	22.93	21.06	0.128	13.441	13441.0	13M4G7W
			DFT-s QAM	22.14	20.27	0.106	13.454	13454.0	13M5D7W
			CP QPSK	21.89	20.02	0.100	13.441	13441.0	13M4G7W
			CP QAM	21.36	19.49	0.089	13.454	13454.0	13M5D7W
20	834	839	DFT-s PI/2 BPSK	22.90	21.03	0.127	17.89	17890.0	17M9G7W
			DFT-s QPSK	22.83	20.96	0.125	17.905	17905.0	17M9G7W
			DFT-s QAM	22.06	20.19	0.104	17.917	17917.0	17M9D7W
			CP QPSK	21.44	19.57	0.091	17.905	17905.0	17M9G7W
			CP QAM	21.02	19.15	0.082	17.917	17917.0	17M9D7W

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5G NR Band n7 Uplink frequency band : 2500 to 2570 MHz

Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
5	2502.5	2567.5	DFT-s PI/2 BPSK	23.21	24.20	0.263	4.5549	4554.9	4M55G7W
			DFT-s QPSK	22.96	23.95	0.248	4.561	4561.0	4M56G7W
			DFT-s QAM	22.09	23.08	0.203	4.5754	4575.4	4M58D7W
			CP QPSK	21.75	22.74	0.188	4.561	4561.0	4M56G7W
			CP QAM	21.44	22.43	0.175	4.5754	4575.4	4M58D7W
10	2505	2565	DFT-s PI/2 BPSK	23.44	24.43	0.277	8.9703	8970.3	8M97G7W
			DFT-s QPSK	23.28	24.27	0.267	8.9647	8964.7	8M96G7W
			DFT-s QAM	22.26	23.25	0.211	9.0001	9000.1	9M00D7W
			CP QPSK	21.74	22.73	0.187	8.9647	8964.7	8M96G7W
			CP QAM	21.37	22.36	0.172	9.0001	9000.1	9M00D7W
15	2507.5	2562.5	DFT-s PI/2 BPSK	23.11	24.10	0.257	13.452	13452.0	13M5G7W
			DFT-s QPSK	23.01	24.00	0.251	13.438	13438.0	13M4G7W
			DFT-s QAM	22.21	23.20	0.209	13.455	13455.0	13M5D7W
			CP QPSK	21.63	22.62	0.183	13.438	13438.0	13M4G7W
			CP QAM	20.92	21.91	0.155	13.455	13455.0	13M5D7W
20	2510	2560	DFT-s PI/2 BPSK	22.97	23.96	0.249	17.926	17926.0	17M9G7W
			DFT-s QPSK	22.95	23.94	0.248	17.923	17923.0	17M9G7W
			DFT-s QAM	22.39	23.38	0.218	17.939	17939.0	17M9D7W
			CP QPSK	21.43	22.42	0.175	17.923	17923.0	17M9G7W
			CP QAM	21.05	22.04	0.160	17.939	17939.0	17M9D7W

5G NR Band n12 Uplink frequency band : 699 to 716 MHz

Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
5	701.5	713.5	DFT-s PI/2 BPSK	22.99	18.66	0.073	4.5487	4548.7	4M55G7W
			DFT-s QPSK	22.83	18.50	0.071	4.5523	4552.3	4M55G7W
			DFT-s QAM	22.00	17.67	0.058	4.5823	4582.3	4M58D7W
			CP QPSK	21.58	17.25	0.053	4.5523	4552.3	4M55G7W
			CP QAM	20.94	16.61	0.046	4.5823	4582.3	4M58D7W
10	704	711	DFT-s PI/2 BPSK	22.78	18.45	0.070	8.9726	8972.6	8M97G7W
			DFT-s QPSK	22.77	18.44	0.070	8.9965	8996.5	9M00G7W
			DFT-s QAM	21.86	17.53	0.057	8.98	8980.0	8M98D7W
			CP QPSK	21.74	17.41	0.055	8.9965	8996.5	9M00G7W
			CP QAM	20.98	16.65	0.046	8.98	8980.0	8M98D7W
15	706.5	708.5	DFT-s PI/2 BPSK	22.92	18.59	0.072	13.436	13436.0	13M4G7W
			DFT-s QPSK	22.86	18.53	0.071	13.463	13463.0	13M5G7W
			DFT-s QAM	21.97	17.64	0.058	13.531	13531.0	13M5D7W
			CP QPSK	21.44	17.11	0.051	13.463	13463.0	13M5G7W
			CP QAM	21.12	16.79	0.048	13.531	13531.0	13M5D7W

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5G NR Band n13_Uplink frequency band : 777 to 787 MHz									
Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
5	779.5	784.5	DFT-s PI/2 BPSK	22.76	18.43	0.070	4.581	4581.0	4M58G7W
			DFT-s QPSK	22.74	18.41	0.069	4.5545	4554.5	4M55G7W
			DFT-s QAM	21.69	17.36	0.054	4.5718	4571.8	4M57D7W
			CP QPSK	21.88	17.55	0.057	4.5545	4554.5	4M55G7W
			CP QAM	20.58	16.25	0.042	4.5718	4571.8	4M57D7W
10	782	782	DFT-s PI/2 BPSK	22.95	18.62	0.073	8.9359	8935.9	8M94G7W
			DFT-s QPSK	22.72	18.39	0.069	8.9347	8934.7	8M93G7W
			DFT-s QAM	21.78	17.45	0.056	8.9666	8966.6	8M97D7W
			CP QPSK	21.31	16.98	0.050	8.9347	8934.7	8M93G7W
			CP QAM	21.01	16.68	0.047	8.9666	8966.6	8M97D7W
5G NR Band n14_Uplink frequency band : 788 to 798 MHz									
Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
5	790.5	795.5	DFT-s PI/2 BPSK	22.99	18.66	0.073	4.5666	4566.6	4M57G7W
			DFT-s QPSK	22.87	18.54	0.071	4.5593	4559.3	4M56G7W
			DFT-s QAM	21.71	17.38	0.055	4.5834	4583.4	4M58D7W
			CP QPSK	21.40	17.07	0.051	4.5593	4559.3	4M56G7W
			CP QAM	20.48	16.15	0.041	4.5834	4583.4	4M58D7W
10	793	793	DFT-s PI/2 BPSK	22.51	18.18	0.066	8.9723	8972.3	8M97G7W
			DFT-s QPSK	22.50	18.17	0.066	8.959	8959.0	8M96G7W
			DFT-s QAM	21.73	17.40	0.055	9.0291	9029.1	9M03D7W
			CP QPSK	21.61	17.28	0.053	8.959	8959.0	8M96G7W
			CP QAM	20.86	16.53	0.045	9.0291	9029.1	9M03D7W

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5G NR Band n25 Uplink frequency band : 1850 to 1915 MHz

Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
5	1852.5	1912.5	DFT-s PI/2 BPSK	23.01	25.50	0.355	4.5755	4575.5	4M58G7W
			DFT-s QPSK	22.90	25.39	0.346	4.5739	4573.9	4M57G7W
			DFT-s QAM	22.18	24.67	0.293	4.5843	4584.3	4M58D7W
			CP QPSK	21.58	24.07	0.255	4.5739	4573.9	4M57G7W
			CP QAM	21.17	23.66	0.232	4.5843	4584.3	4M58D7W
10	1855	1910	DFT-s PI/2 BPSK	23.23	25.72	0.373	8.9641	8964.1	8M96G7W
			DFT-s QPSK	23.15	25.64	0.366	8.9827	8982.7	8M98G7W
			DFT-s QAM	21.85	24.34	0.272	8.9742	8974.2	8M97D7W
			CP QPSK	20.89	23.38	0.218	8.9827	8982.7	8M98G7W
			CP QAM	21.17	23.66	0.232	8.9742	8974.2	8M97D7W
15	1857.5	1907.5	DFT-s PI/2 BPSK	23.14	25.63	0.366	13.435	13435.0	13M4G7W
			DFT-s QPSK	23.07	25.56	0.360	13.466	13466.0	13M5G7W
			DFT-s QAM	22.03	24.52	0.283	13.431	13431.0	13M4D7W
			CP QPSK	21.65	24.14	0.259	13.466	13466.0	13M5G7W
			CP QAM	21.05	23.54	0.226	13.431	13431.0	13M4D7W
20	1860	1905	DFT-s PI/2 BPSK	23.02	25.51	0.356	17.895	17895.0	17M9G7W
			DFT-s QPSK	22.87	25.36	0.344	17.922	17922.0	17M9G7W
			DFT-s QAM	22.08	24.57	0.286	17.95	17950.0	18M0D7W
			CP QPSK	21.26	23.75	0.237	17.922	17922.0	17M9G7W
			CP QAM	21.02	23.51	0.224	17.95	17950.0	18M0D7W

5G NR Band n26 Uplink frequency band : 824 to 849 MHz

Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
5	826.5	846.5	DFT-s PI/2 BPSK	22.94	21.07	0.128	4.5691	4569.1	4M57G7W
			DFT-s QPSK	22.92	21.05	0.127	4.5647	4564.7	4M56G7W
			DFT-s QAM	22.10	20.23	0.105	4.5698	4569.8	4M57D7W
			CP QPSK	21.65	19.78	0.095	4.5647	4564.7	4M56G7W
			CP QAM	20.81	18.94	0.078	4.5698	4569.8	4M57D7W
10	829	844	DFT-s PI/2 BPSK	22.90	21.03	0.127	8.9572	8957.2	8M96G7W
			DFT-s QPSK	22.89	21.02	0.126	8.9793	8979.3	8M98G7W
			DFT-s QAM	22.03	20.16	0.104	8.9902	8990.2	8M99D7W
			CP QPSK	21.47	19.60	0.091	8.9793	8979.3	8M98G7W
			CP QAM	21.00	19.13	0.082	8.9902	8990.2	8M99D7W
15	831.5	841.5	DFT-s PI/2 BPSK	22.77	20.90	0.123	13.433	13433.0	13M4G7W
			DFT-s QPSK	22.76	20.89	0.123	13.417	13417.0	13M4G7W
			DFT-s QAM	21.88	20.01	0.100	13.483	13483.0	13M5D7W
			CP QPSK	21.18	19.31	0.085	13.417	13417.0	13M4G7W
			CP QAM	20.45	18.58	0.072	13.483	13483.0	13M5D7W
20	834	839	DFT-s PI/2 BPSK	22.91	21.04	0.127	17.872	17872.0	17M9G7W
			DFT-s QPSK	22.74	20.87	0.122	17.893	17893.0	17M9G7W
			DFT-s QAM	21.95	20.08	0.102	17.917	17917.0	17M9D7W
			CP QPSK	21.25	19.38	0.087	17.893	17893.0	17M9G7W
			CP QAM	20.50	18.63	0.073	17.917	17917.0	17M9D7W

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5G NR Band n26 Part90s_Uplink frequency band : 814 to 824 MHz

Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
5	816.5	821.5	DFT-s PI/2 BPSK	22.80	18.47	0.070	4.5602	4560.2	4M56G7W
			DFT-s QPSK	22.73	18.40	0.069	4.5565	4556.5	4M56G7W
			DFT-s QAM	21.71	17.38	0.055	4.566	4566.0	4M57D7W
			CP QPSK	21.04	16.71	0.047	4.5565	4556.5	4M56G7W
			CP QAM	20.63	16.30	0.043	4.566	4566.0	4M57D7W
10	819	819	DFT-s PI/2 BPSK	22.68	18.35	0.068	8.9226	8922.6	8M92G7W
			DFT-s QPSK	22.53	18.20	0.066	8.9211	8921.1	8M92G7W
			DFT-s QAM	21.46	17.13	0.052	8.9379	8937.9	8M94D7W
			CP QPSK	21.21	16.88	0.049	8.9211	8921.1	8M92G7W
			CP QAM	20.62	16.29	0.043	8.9379	8937.9	8M94D7W

5G NR Band n30_Uplink frequency band : 2305 to 2315 MHz

Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
5	2307.5	2312.5	DFT-s PI/2 BPSK	21.71	22.70	0.186	4.5474	4547.4	4M55G7W
			DFT-s QPSK	21.67	22.66	0.185	4.564	4564.0	4M56G7W
			DFT-s QAM	20.60	21.59	0.144	4.5739	4573.9	4M57D7W
			CP QPSK	20.65	21.64	0.146	4.564	4564.0	4M56G7W
			CP QAM	20.25	21.24	0.133	4.5739	4573.9	4M57D7W
10	2310	2310	DFT-s PI/2 BPSK	21.52	22.51	0.178	8.9652	8965.2	8M97G7W
			DFT-s QPSK	21.49	22.48	0.177	8.9648	8964.8	8M96G7W
			DFT-s QAM	20.61	21.60	0.145	8.9946	8994.6	8M99D7W
			CP QPSK	20.04	21.03	0.127	8.9648	8964.8	8M96G7W
			CP QAM	19.55	20.54	0.113	8.9946	8994.6	8M99D7W

5G NR Band n38_Uplink frequency band : 2570 to 2620 MHz

Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
10	2575	2615	DFT-s PI/2 BPSK	23.08	24.07	0.255	8.5973	8597.3	8M60G7W
			DFT-s QPSK	22.99	23.98	0.250	8.6415	8641.5	8M64G7W
			DFT-s QAM	21.94	22.93	0.196	8.708	8708.0	8M71D7W
			CP QPSK	21.80	22.79	0.190	8.6415	8641.5	8M64G7W
			CP QAM	21.03	22.02	0.159	8.708	8708.0	8M71D7W
15	2577.5	2612.5	DFT-s PI/2 BPSK	23.04	24.03	0.253	12.945	12945.0	12M9G7W
			DFT-s QPSK	22.99	23.98	0.250	12.948	12948.0	12M9G7W
			DFT-s QAM	21.94	22.93	0.196	12.935	12935.0	12M9D7W
			CP QPSK	21.71	22.70	0.186	12.948	12948.0	12M9G7W
			CP QAM	21.27	22.26	0.168	12.935	12935.0	12M9D7W
20	2580	2610	DFT-s PI/2 BPSK	22.99	23.98	0.250	17.95	17950.0	18M0G7W
			DFT-s QPSK	22.93	23.92	0.247	17.939	17939.0	17M9G7W
			DFT-s QAM	21.80	22.79	0.190	17.971	17971.0	18M0D7W
			CP QPSK	21.41	22.40	0.174	17.939	17939.0	17M9G7W
			CP QAM	20.76	21.75	0.150	17.971	17971.0	18M0D7W

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FCC 5G NR Band n41_Uplink frequency band : 2496 to 2690 MHz

Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
10	2501.01	2685	DFT-s PI/2 BPSK	23.01	24.00	0.251	8.6845	8684.5	8M68G7W
			DFT-s QPSK	22.97	23.96	0.249	8.6697	8669.7	8M67G7W
			DFT-s QAM	22.01	23.00	0.200	8.6484	8648.4	8M65D7W
			CP QPSK	21.44	22.43	0.175	8.6697	8669.7	8M67G7W
			CP QAM	20.97	21.96	0.157	8.6484	8648.4	8M65D7W
15	2503.5	2682.48	DFT-s PI/2 BPSK	23.05	24.04	0.254	12.933	12933.0	12M9G7W
			DFT-s QPSK	23.02	24.01	0.252	12.947	12947.0	12M9G7W
			DFT-s QAM	21.83	22.82	0.191	12.925	12925.0	12M9D7W
			CP QPSK	21.54	22.53	0.179	12.947	12947.0	12M9G7W
			CP QAM	21.16	22.15	0.164	12.925	12925.0	12M9D7W
20	2506.02	2679.99	DFT-s PI/2 BPSK	22.92	23.91	0.246	17.939	17939.0	17M9G7W
			DFT-s QPSK	22.91	23.90	0.245	17.938	17938.0	17M9G7W
			DFT-s QAM	21.69	22.68	0.185	17.961	17961.0	18M0D7W
			CP QPSK	21.37	22.36	0.172	17.938	17938.0	17M9G7W
			CP QAM	20.64	21.63	0.146	17.961	17961.0	18M0D7W

5G NR Band n66_Uplink frequency band : 1710 to 1780 MHz

Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
5	1712.5	1777.5	DFT-s PI/2 BPSK	22.96	25.45	0.351	4.5711	4571.1	4M57G7W
			DFT-s QPSK	22.83	25.32	0.340	4.5878	4587.8	4M59G7W
			DFT-s QAM	21.81	24.30	0.269	4.5633	4563.3	4M56D7W
			CP QPSK	21.44	23.93	0.247	4.5878	4587.8	4M59G7W
			CP QAM	20.81	23.30	0.214	4.5633	4563.3	4M56D7W
10	1715	1775	DFT-s PI/2 BPSK	22.77	25.26	0.336	8.9827	8982.7	8M98G7W
			DFT-s QPSK	22.76	25.25	0.335	8.9787	8978.7	8M98G7W
			DFT-s QAM	21.86	24.35	0.272	9.0023	9002.3	9M00D7W
			CP QPSK	21.04	23.53	0.225	8.9787	8978.7	8M98G7W
			CP QAM	20.78	23.27	0.212	9.0023	9002.3	9M00D7W
15	1717.5	1772.5	DFT-s PI/2 BPSK	23.04	25.53	0.357	13.443	13443.0	13M4G7W
			DFT-s QPSK	22.99	25.48	0.353	13.468	13468.0	13M5G7W
			DFT-s QAM	22.20	24.69	0.294	13.505	13505.0	13M5D7W
			CP QPSK	21.17	23.66	0.232	13.468	13468.0	13M5G7W
			CP QAM	20.56	23.05	0.202	13.505	13505.0	13M5D7W
20	1720	1770	DFT-s PI/2 BPSK	22.80	25.29	0.338	17.924	17924.0	17M9G7W
			DFT-s QPSK	22.78	25.27	0.337	17.941	17941.0	17M9G7W
			DFT-s QAM	22.02	24.51	0.282	17.924	17924.0	17M9D7W
			CP QPSK	21.28	23.77	0.238	17.941	17941.0	17M9G7W
			CP QAM	21.00	23.49	0.223	17.924	17924.0	17M9D7W

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5G NR Band n70_Uplink frequency band : 1695 to 1710 MHz

Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
5	1697.5	1707.5	DFT-s PI/2 BPSK	22.97	25.46	0.352	4.5472	4547.2	4M55G7W
			DFT-s QPSK	22.91	25.40	0.347	4.5479	4547.9	4M55G7W
			DFT-s QAM	22.04	24.53	0.284	4.5366	4536.6	4M54D7W
			CP QPSK	21.29	23.78	0.239	4.5479	4547.9	4M55G7W
			CP QAM	21.13	23.62	0.230	4.5366	4536.6	4M54D7W
10	1700	1705	DFT-s PI/2 BPSK	23.03	25.52	0.356	8.9545	8954.5	8M95G7W
			DFT-s QPSK	22.87	25.36	0.344	8.9878	8987.8	8M99G7W
			DFT-s QAM	21.80	24.29	0.269	8.9745	8974.5	8M97D7W
			CP QPSK	21.42	23.91	0.246	8.9878	8987.8	8M99G7W
			CP QAM	21.18	23.67	0.233	8.9745	8974.5	8M97D7W
15	1702.5	1702.5	DFT-s PI/2 BPSK	23.00	25.49	0.354	13.443	13443.0	13M4G7W
			DFT-s QPSK	22.78	25.27	0.337	13.429	13429.0	13M4G7W
			DFT-s QAM	22.04	24.53	0.284	13.423	13423.0	13M4D7W
			CP QPSK	21.29	23.78	0.239	13.429	13429.0	13M4G7W
			CP QAM	20.51	23.00	0.200	13.423	13423.0	13M4D7W

5G NR Band n71_Uplink frequency band : 663 to 698 MHz

Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	ERP Average (dBm)	ERP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
5	665.5	695.5	DFT-s PI/2 BPSK	23.12	20.81	0.121	4.5598	4559.8	4M56G7W
			DFT-s QPSK	23.05	20.74	0.119	4.5667	4566.7	4M57G7W
			DFT-s QAM	21.92	19.61	0.091	4.5723	4572.3	4M57D7W
			CP QPSK	21.32	19.01	0.080	4.5667	4566.7	4M57G7W
			CP QAM	20.84	18.53	0.071	4.5723	4572.3	4M57D7W
10	668	693	DFT-s PI/2 BPSK	23.02	20.71	0.118	8.9802	8980.2	8M98G7W
			DFT-s QPSK	22.98	20.67	0.117	8.9682	8968.2	8M97G7W
			DFT-s QAM	22.18	19.87	0.097	8.9953	8995.3	9M00D7W
			CP QPSK	21.66	19.35	0.086	8.9682	8968.2	8M97G7W
			CP QAM	21.10	18.79	0.076	8.9953	8995.3	9M00D7W
15	670.5	690.5	DFT-s PI/2 BPSK	23.01	20.70	0.117	13.415	13415.0	13M4G7W
			DFT-s QPSK	22.96	20.65	0.116	13.478	13478.0	13M5G7W
			DFT-s QAM	22.08	19.77	0.095	13.478	13478.0	13M5D7W
			CP QPSK	21.33	19.02	0.080	13.478	13478.0	13M5G7W
			CP QAM	20.89	18.58	0.072	13.478	13478.0	13M5D7W
20	673	688	DFT-s PI/2 BPSK	22.83	20.52	0.113	17.878	17878.0	17M9G7W
			DFT-s QPSK	22.79	20.48	0.112	17.93	17930.0	17M9G7W
			DFT-s QAM	21.89	19.58	0.091	17.954	17954.0	18M0D7W
			CP QPSK	21.30	18.99	0.079	17.93	17930.0	17M9G7W
			CP QAM	20.93	18.62	0.073	17.954	17954.0	18M0D7W

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5G NR Band n77_Part27_Uplink frequency band : 3450 to 3550 MHz

Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
10	3455.01	3544.98	DFT-s PI/2 BPSK	23.18	23.59	0.229	8.6582	8658.2	8M66G7W
			DFT-s QPSK	23.13	23.54	0.226	8.6204	8620.4	8M62G7W
			DFT-s QAM	22.19	22.60	0.182	8.6678	8667.8	8M67D7W
			CP QPSK	21.89	22.30	0.170	8.6204	8620.4	8M62G7W
			CP QAM	21.04	21.45	0.140	8.6678	8667.8	8M67D7W
15	3457.5	3542.49	DFT-s PI/2 BPSK	23.03	23.44	0.221	12.951	12951.0	13M0G7W
			DFT-s QPSK	22.97	23.38	0.218	12.933	12933.0	12M9G7W
			DFT-s QAM	21.88	22.29	0.169	12.961	12961.0	13M0D7W
			CP QPSK	21.98	22.39	0.173	12.933	12933.0	12M9G7W
			CP QAM	21.31	21.72	0.149	12.961	12961.0	13M0D7W
20	3460.02	3540	DFT-s PI/2 BPSK	23.02	23.43	0.220	17.929	17929.0	17M9G7W
			DFT-s QPSK	22.90	23.31	0.214	17.947	17947.0	17M9G7W
			DFT-s QAM	22.10	22.51	0.178	17.954	17954.0	18M0D7W
			CP QPSK	21.30	21.71	0.148	17.947	17947.0	17M9G7W
			CP QAM	20.80	21.21	0.132	17.954	17954.0	18M0D7W

5G NR Band n77_Part27_Uplink frequency band : 3700 to 3980 MHz

Bandwidth (MHz)	Low Frequency (MHz)	Upper Frequency (MHz)	Modulation	Conducted Average (dBm)	EIRP Average (dBm)	EIRP Average (W)	99% BW (MHz)	99% BW (kHz)	Type of Emission
10	3705	3975	DFT-s PI/2 BPSK	23.53	23.94	0.248	8.6498	8649.8	8M65G7W
			DFT-s QPSK	23.28	23.69	0.234	8.6663	8666.3	8M67G7W
			DFT-s QAM	22.15	22.56	0.180	8.6459	8645.9	8M65D7W
			CP QPSK	21.66	22.07	0.161	8.6663	8666.3	8M67G7W
			CP QAM	21.34	21.75	0.150	8.6459	8645.9	8M65D7W
15	3707.52	3972.48	DFT-s PI/2 BPSK	23.12	23.53	0.225	12.948	12948.0	12M9G7W
			DFT-s QPSK	22.81	23.22	0.210	12.905	12905.0	12M9G7W
			DFT-s QAM	21.71	22.12	0.163	12.978	12978.0	13M0D7W
			CP QPSK	21.06	21.47	0.140	12.905	12905.0	12M9G7W
			CP QAM	20.77	21.18	0.131	12.978	12978.0	13M0D7W
20	3710.01	3969.99	DFT-s PI/2 BPSK	23.13	23.54	0.226	17.89	17890.0	17M9G7W
			DFT-s QPSK	23.09	23.50	0.224	17.94	17940.0	17M9G7W
			DFT-s QAM	21.80	22.21	0.166	17.963	17963.0	18M0D7W
			CP QPSK	21.55	21.96	0.157	17.94	17940.0	17M9G7W
			CP QAM	20.64	21.05	0.127	17.963	17963.0	18M0D7W

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1.5 Test Methodology of Applied Standards

FCC 47 CFR Part 2, 22H, 24E, 27C, Part 90

ANSI C63.26-2015

KDB971168 D01 Power Meas license Digital System v03r01

KDB412172 D01 Determining ERP and EIRP v01r01

1.6 Test Facility

Laboratory	Test Site Address	Test Site Name	FCC Designation number	IC CAB identifier
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	SAC 1	TW0027	TW3702
		SAC 2		
		SAC 3		
		Conduction 1		
		Conducted 1		
		Conducted 2		
		Conducted 3		
		Conducted 4		
		Conducted 5		
		Conducted 6		
	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	Conduction C	TW0028	
		SAC C		
		SAC D		
		SAC G		
		Conducted A		
		Conducted B		
		Conducted C		
		Conducted D		
		Conducted E		
		Conducted F		
		Conducted G		

Note: Test site name is remarked on the equipment list in each section of this report as an indication where measurements occurred in specific test site and address.

1.7 Special Accessories

No special accessories were used during testing.

1.8 Equipment Modifications

There was no modifications incorporated into the EUT.

1.9 Radiated Emission Test Sites For Measurements From 9 kHz To 30 MHz

Radiated emission below 30MHz is measured in a 9m*6m*6m semi-anechoic chamber, the measurements correspond to those obtained at an open-field test site.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

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2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

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

2.2 EUT Exercise

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

2.3 Test Procedure

2.3.1 Conducted Measurement at Antenna Port

The EUT is placed on a table which is 0.8 m above ground plane. A low loss of RF cable was used to connect the antenna port of EUT to measurement equipment.

2.3.2 Radiated Emissions (ERP/EIRP)

The EUT is placed on a turn table, for emission measurements below 1 GHz is 0.8 m above ground plane, for emission measurements above 1 GHz, the table height shall be 1.5 m. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both Horizontal and Vertical. In order to find out the max. emission, the relative positions of this transmitter (EUT) was rotated through three orthogonal axes and measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.

2.4 Measurement Results Explanation Example

For all conducted test items:

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

Note:

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

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2.5 Final Amplifier Voltage and Current Information:

5G NR BAND n2		
CP-OFDM_SCS 15 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:5MHz Mod:256QAM	3.8	429
Bandwidth:10MHz Mod:256QAM	3.8	431
Bandwidth:15MHz Mod:256QAM	3.8	438
Bandwidth:20MHz Mod:256QAM	3.8	446
5G NR BAND n5		
CP-OFDM_SCS 15 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:5MHz Mod:256QAM	3.8	366
Bandwidth:10MHz Mod:256QAM	3.8	368
Bandwidth:15MHz Mod:256QAM	3.8	372
Bandwidth:20MHz Mod:256QAM	3.8	378
5G NR BAND n7		
CP-OFDM_SCS 15 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:5MHz Mod:256QAM	3.8	452
Bandwidth:10MHz Mod:256QAM	3.8	477
Bandwidth:15MHz Mod:256QAM	3.8	468
Bandwidth:20MHz Mod:256QAM	3.8	475
5G NR BAND n12		
CP-OFDM_SCS 15 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:5MHz Mod:256QAM	3.8	394
Bandwidth:10MHz Mod:256QAM	3.8	415
Bandwidth:15MHz Mod:256QAM	3.8	396
5G NR BAND n13		
CP-OFDM_SCS 15 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:5MHz Mod:256QAM	3.8	385
Bandwidth:10MHz Mod:256QAM	3.8	391
5G NR BAND n14		
CP-OFDM_SCS 15 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:5MHz Mod:256QAM	3.8	375
Bandwidth:10MHz Mod:256QAM	3.8	388

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5G NR BAND n25		
CP-OFDM_SCS 15 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:5MHz Mod:256QAM	3.8	428
Bandwidth:10MHz Mod:256QAM	3.8	448
Bandwidth:15MHz Mod:256QAM	3.8	436
Bandwidth:20MHz Mod:256QAM	3.8	435
5G NR BAND n26		
CP-OFDM_SCS 15 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:5MHz Mod:256QAM	3.8	365
Bandwidth:10MHz Mod:256QAM	3.8	368
Bandwidth:15MHz Mod:256QAM	3.8	376
Bandwidth:20MHz Mod:256QAM	3.8	375
5G NR BAND n26 Part90s		
CP-OFDM_SCS 15 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:5MHz Mod:256QAM	3.8	359
Bandwidth:10MHz Mod:256QAM	3.8	388
5G NR BAND n30		
CP-OFDM_SCS 15 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:5MHz Mod:256QAM	3.8	438
Bandwidth:10MHz Mod:256QAM	3.8	453
5G NR BAND n38		
CP-OFDM_SCS 30 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:10MHz Mod:256QAM	3.8	148
Bandwidth:15MHz Mod:256QAM	3.8	146
Bandwidth:20MHz Mod:256QAM	3.8	158
5G NR BAND n41		
CP-OFDM_SCS 30 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:10MHz Mod:256QAM	3.8	160
Bandwidth:15MHz Mod:256QAM	3.8	161
Bandwidth:20MHz Mod:256QAM	3.8	159

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5G NR BAND n66		
CP-OFDM_SCS 15 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:5MHz Mod:256QAM	3.8	443
Bandwidth:10MHz Mod:256QAM	3.8	440
Bandwidth:15MHz Mod:256QAM	3.8	452
Bandwidth:20MHz Mod:256QAM	3.8	431
5G NR BAND n70		
CP-OFDM_SCS 15 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:5MHz Mod:256QAM	3.8	428
Bandwidth:10MHz Mod:256QAM	3.8	445
Bandwidth:15MHz Mod:256QAM	3.8	441
5G NR BAND n71		
CP-OFDM_SCS 15 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:5MHz Mod:256QAM	3.8	379
Bandwidth:10MHz Mod:256QAM	3.8	385
Bandwidth:15MHz Mod:256QAM	3.8	388
Bandwidth:20MHz Mod:256QAM	3.8	390
5G NR BAND n77 Part27		
CP-OFDM_SCS 30 kHz		
Test mode	DC voltage (V)	DC current (mA)
Bandwidth:10MHz Mod:256QAM	3.8	160
Bandwidth:15MHz Mod:256QAM	3.8	162
Bandwidth:20MHz Mod:256QAM	3.8	158

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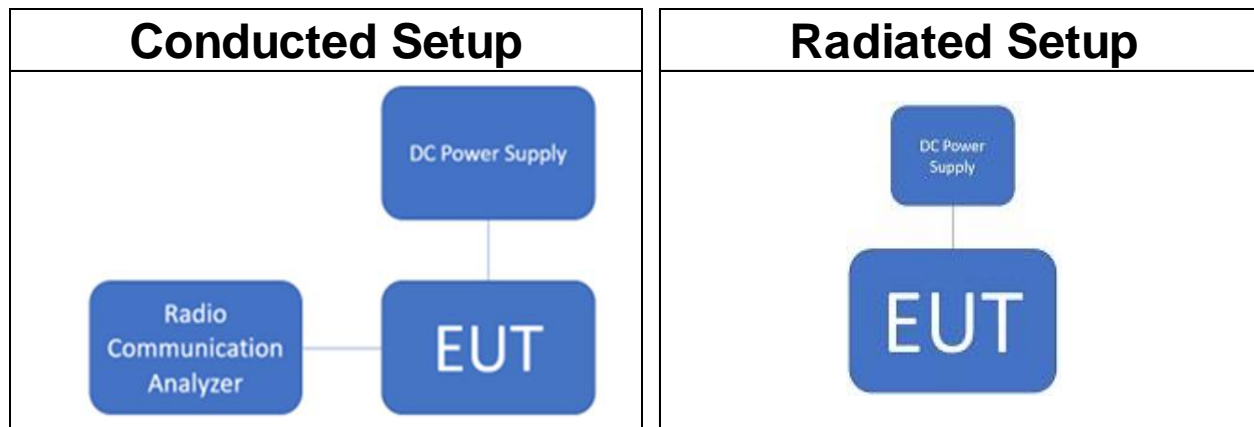
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2.6 Test Configuration



Note: Radio Communication Analyzer is placed in remote side for radiated test.

2.7 Control Unit(s)

N/A

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3 SUMMARY OF TEST RESULTS

FCC Rules	Description Of Test	Result
§2.1046(a)	RF Power Output	Compliant
§22.913(a)(5) §24.232(c) §27.50(a)(3)(i) §27.50(b)(9) §27.50(c)(9) §27.50(d)(4) §27.50(h)(2) §27.50(j)(3) §27.50(k)(3) §90.542(a)(6) §90.635(b)	ERP/ EIRP measurement	Compliant
§2.1049(h)	99% & 26dB Occupied Bandwidth	Compliant
§2.1051 §22.917(a)(b) §24.238(a)(b) §27.53 (n)(2) §27.53(g) §27.53(h)(1)&(3) §27.53(l)(2) §27.53(m) §27.53(m)(4) §27.53(m)(4)(6) §90.691(a) §90.210(n) §90.543(e)(2)~(5) §96.41 (e)(2)	Out of Band Emissions at Antenna Terminals and Band Edge / Emission mask requirements	Compliant

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§2.1053 §22.917(a)(b) §24.238(a)(b) §27.53(g) §27.53(h) §27.53(l)(2) §27.53(m)(4) §27.50(n)(2) §90.543(e)(2)~(5) §90.543 (f) §90.691(a) §96.41 (e)(2)	Field Strength of Spurious Radiation	Compliant
§22.913(d) §24.232(d) §27.50(a)(1)(B) §27.50(a)(B) §27.50(j)(4) §27.50 (k)(4) §96.41(g)	Peak to Average Ratio	Compliant
§2.1055(a)(1) §22.355 §24.235 §27.54 §90.539(e)	Frequency Stability	Compliant

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4 DESCRIPTION OF TEST MODES

4.1 The Worst Test Modes and Channel Details

1. The EUT has been tested under operating condition.
2. Pre-Scan has been conducted to determine the worst-case scenario from all possible combinations among available modulations, data rates and antenna ports, the worst case configurations listed below for the final test.
3. The field strength of radiated emission was measured as the EUT positioned in different orthogonal planes (E1/E2/H) based on actual usage of the EUT to pre-scan the emissions for determining the worst case scenario.

4.2 Measurement Configuration

Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #						
		L	M	H	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full	
Conducted Power	2	v	v	v	v	v	v	v	v												v	v	v	v	v	v	v	v							v
Frequency Stability			v																																v
Occupied Bandwidth		v	v	v	v			v	v	v												v	v	v	v	v									v
Bandedge		v			v	v	v	v	v													v							v	v					v
Mask																																			
Conducted Emission		v	v	v	v	v	v	v	v													v											v		
CCDF		v	v	v	v	v	v	v	v																v										v
Radiated Emission		v	v	v																	v										v				
Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #						
		L	M	H	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full	
Conducted Power	5	v	v	v	v	v	v	v	v												v	v	v	v	v	v	v	v							v
Frequency Stability			v																																v
Occupied Bandwidth		v	v	v	v	v	v	v	v													v	v	v	v	v									v
Bandedge		v			v	v	v	v	v													v							v	v					v
Mask																																			
Conducted Emission		v	v	v	v	v	v	v	v													v											v		
CCDF		v	v	v	v	v	v	v	v																v										v
Radiated Emission		v	v	v																	v										v				
Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #						
		L	M	H	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full	
Conducted Power	7	v	v	v	v	v	v	v													v	v	v	v	v	v	v	v							v
Frequency Stability			v																																v
Occupied Bandwidth		v	v	v	v	v	v	v														v	v	v	v	v									v
Bandedge		v																																	
Mask		v	v	v	v	v	v	v														v							v	v					v
Conducted Emission		v	v	v	v	v	v	v														v													
CCDF		v	v	v	v	v	v	v																	v										v
Radiated Emission		v	v	v																	v														
Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #						
		L	M	H	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full	
Conducted Power	12	v	v	v	v	v	v														v	v	v	v	v	v	v	v							v
Frequency Stability			v																																v
Occupied Bandwidth		v	v	v	v	v	v	v														v	v	v	v	v									v
Bandedge		v				v	v	v														v													
Mask																																			
Conducted Emission		v	v	v	v	v	v	v														v													
CCDF		v	v	v	v	v	v	v																	v										v
Radiated Emission		v	v	v																	v														
Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #						
		L	M	H	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full	
Conducted Power	13	v	v	v	v	v															v	v	v	v	v	v	v	v							v
Frequency Stability			v																																v
Occupied Bandwidth		v	v	v	v	v																v	v	v	v	v									v
Bandedge		v				v	v																												
Mask																																			
Conducted Emission		v	v	v	v	v	v															v													
CCDF		v	v	v	v	v	v																		v										
Radiated Emission		v	v	v																	v														

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Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #								
		L	M	H	5	10	15	20	25	30		40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full			
Conducted Power	14	v	v	v	v	v														v	v	v	v	v	v	v	v					v	v	v	v		
Frequency Stability			v			v																													v		
Occupied Bandwidth			v	v	v	v	v													v	v	v	v	v											v		
Bandedge			v		v	v	v													v									v	v						v	
Mask																																					
Conducted Emission			v	v	v	v														v												v					
CCDF			v	v	v	v	v																		v											v	
Radiated Emission		v	v	v	v															v																	
Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #								
		L	M	H	5	10	15	20	25	30		40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full			
Conducted Power	25	v	v	v	v	v	v	v												v	v	v	v	v	v	v	v					v	v	v	v		
Frequency Stability				v					v																											v	
Occupied Bandwidth			v	v	v	v	v	v	v											v	v	v	v	v												v	
Bandedge			v		v	v	v	v	v											v									v	v						v	
Mask																																					
Conducted Emission			v	v	v	v	v	v	v											v													v				
CCDF			v	v	v	v	v	v	v																v											v	
Radiated Emission		v	v	v																v																	
Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #								
		L	M	H	5	10	15	20	25	30		40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full			
Conducted Power	26	v	v	v	v	v	v	v												v	v	v	v	v	v	v	v					v	v	v	v		
Frequency Stability				v					v																											v	
Occupied Bandwidth			v	v	v	v	v	v	v											v	v	v	v	v												v	
Bandedge			v		v	v	v	v	v											v									v	v						v	
Mask																																					
Conducted Emission			v	v	v	v	v	v	v											v													v				
CCDF			v	v	v	v	v	v	v																v											v	
Radiated Emission		v	v	v																v																	
Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #								
		L	M	H	5	10	15	20	25	30		40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full			
Conducted Power	26 Par90s	v	v	v	v	v														v	v	v	v	v	v	v	v					v	v	v	v		
Frequency Stability				v					v																											v	
Occupied Bandwidth			v	v	v	v	v													v	v	v	v	v												v	
Bandedge																																					
Mask			v	v	v	v	v													v									v	v						v	
Conducted Emission			v	v	v	v	v													v													v				
CCDF			v	v	v	v	v																		v											v	
Radiated Emission		v	v	v																v																	
Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #								
		L	M	H	5	10	15	20	25	30		40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full			
Conducted Power	30	v	v	v	v	v														v	v	v	v	v	v	v	v					v	v	v	v		
Frequency Stability				v					v																											v	
Occupied Bandwidth			v	v	v	v	v													v	v	v	v	v												v	
Bandedge																																					
Mask			v	v	v	v	v													v									v	v						v	
Conducted Emission			v	v	v	v	v													v													v				
CCDF			v	v	v	v	v																		v											v	
Radiated Emission		v	v	v																v																	
Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #								
		L	M	H	5	10	15	20	25	30		40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full			
Conducted Power	38	v	v	v		v	v	v												v	v	v	v	v	v	v	v					v	v	v	v		
Frequency Stability				v					v																											v	
Occupied Bandwidth			v	v	v		v	v	v											v	v	v	v	v												v	
Bandedge																																					
Mask			v	v	v		v	v	v											v									v	v						v	
Conducted Emission			v	v	v		v	v	v											v																	
CCDF			v	v	v		v	v	v																												
Radiated Emission		v	v	v																v																	
Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #								
		L	M	H	5	10	15	20	25	30		40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full			
Conducted Power	41	v	v	v		v	v	v												v	v	v	v	v	v	v	v					v	v	v	v		
Frequency Stability				v					v																											v	
Occupied Bandwidth			v	v	v		v	v	v											v	v	v	v	v												v	
Bandedge																																					
Mask			v	v	v		v	v	v											v									v	v							v
Conducted Emission			v	v	v		v	v	v											v																	
CCDF			v	v	v		v	v	v																												
Radiated Emission		v	v	v																v																	

Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #							
		L	M	H	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full		
Conducted Power	66	v	v	v	v	v	v	v	v												v	v	v	v	v	v	v	v					v	v	v	v
Frequency Stability			v						v																	v									v	
Occupied Bandwidth		v	v	v	v	v	v	v	v												v	v	v	v	v										v	
Bandedge		v		v	v	v	v	v	v												v					v			v	v					v	
Mask																																				
Conducted Emission		v	v	v	v	v	v	v	v												v											v				
CCDF		v	v	v	v	v	v	v	v																v										v	
Radiated Emission		v	v	v	v				v												v											v				
Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #							
		L	M	H	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full		
Conducted Power	70	v	v	v	v	v	v	v													v	v	v	v	v	v	v	v					v	v	v	
Frequency Stability			v					v																	v										v	
Occupied Bandwidth		v	v	v	v	v	v	v													v	v	v	v	v										v	
Bandedge		v		v	v	v	v	v													v					v			v	v					v	
Mask																																				
Conducted Emission		v	v	v	v	v	v	v													v											v				
CCDF		v	v	v	v	v	v	v													v				v										v	
Radiated Emission		v	v	v	v																v											v				
Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #							
		L	M	H	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full		
Conducted Power	71	v	v	v	v	v	v	v													v	v	v	v	v	v	v	v					v	v	v	
Frequency Stability			v					v																	v										v	
Occupied Bandwidth		v	v	v	v	v	v	v													v	v	v	v	v										v	
Bandedge		v		v	v	v	v	v													v					v			v	v					v	
Mask																																				
Conducted Emission		v	v	v	v	v	v	v													v											v				
CCDF		v	v	v	v	v	v	v																	v										v	
Radiated Emission		v	v	v	v																v											v				
Test Items	Band	Test Channel			Bandwidth (MHz)																Modulation DFT-s-OFDM					Modulation CP-OFDM			RB #							
		L	M	H	5	10	15	20	25	30	35	40	45	50	60	70	80	90	100	BPSK	QPSK	16 QAM	64 QAM	256 QAM	QPSK	16 QAM	64 QAM	256 QAM	Edge 1RB_Left	Edge 1RB_Right	Inner 1RB_Left	Inner 1RB_Right	Inner Full	Outer Full		
Conducted Power	77	v	v	v		v	v	v													v	v	v	v	v	v	v	v					v	v	v	
Frequency Stability			v					v																	v										v	
Occupied Bandwidth		v	v	v		v	v	v													v	v	v	v	v										v	
Bandedge		v		v		v	v	v													v					v			v	v					v	
Mask																																				
Conducted Emission		v	v	v		v	v	v													v											v				
CCDF		v	v	v		v	v	v																	v										v	
Radiated Emission		v	v	v		v															v											v				

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5 MEASUREMENT UNCERTAINTY

Test Items	Uncertainty
Output Power measurement	+/- 0.97 dB
ERP/ EIRP measurement	+/- 2.16 dB
	+/- 2.16 dB
Emission Bandwidth	+/- 1.38 Hz
Out of Band Emissions at Antenna Terminals and Band Edge	+/- 0.77 dB
Peak to Average Ratio	+/- 0.97 dB
Frequency Stability vs. Temperature	+/- 1.48 Hz
Frequency Stability vs. Voltage	+/- 1.48 Hz
Temperature	+/- 0.6 °C
Humidity	+/- 3 %
DC / AC Power Source	+/- 1 %

Radiated Spurious Emission Measurement Uncertainty			
Polarization: Vertical	+/-	1.89 dB	9kHz~30MHz
	+/-	4.1 dB	30MHz - 1000MHz
	+/-	3.37 dB	1GHz - 18GHz
	+/-	3.83 dB	18GHz - 40GHz
Polarization: Horizontal	+/-	1.89 dB	9kHz~30MHz
	+/-	4.1 dB	30MHz - 1000MHz
	+/-	3.37 dB	1GHz - 18GHz
	+/-	3.83 dB	18GHz - 40GHz
Radiated Spurious Emission	+/-	2 dB	33GHz-50GHz
	+/-	1.59 dB	50GHz-60GHz
	+/-	1.71 dB	60GHz-90GHz
	+/-	1.64 dB	90GHz-140GHz
	+/-	3.84 dB	140GHz-220GHz

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

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6 MEASUREMENT EQUIPMENT USED

6.1 Conducted Measurement

Conducted Emission Test Site: Conducted 3					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
Attenuator	Mini-Circuits	BW-S10W2+	12	12/11/2024	12/10/2025
DC Block	Mini-Circuits	BLK-18-S+	12	12/11/2024	12/10/2025
DC Power Supply	Gwinstek	SPS-3610	GEV856761	09/13/2024	09/12/2025
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY60240503	12/16/2024	12/15/2025
PXA Spectrum Analyzer	Agilent	N9030A	MY53120760	04/25/2025	04/24/2026
PXA Spectrum Analyzer	Keysight	N9030B	MY61330494	04/16/2025	04/15/2026
Radio Communication Analyzer	KEYSIGHT	E7515B	MY59321566	02/12/2025	02/11/2026
Splitter	RF-Lambda	RFLT2W1G18G	11-JSPF412-017	12/11/2024	12/10/2025
Temperature Chamber	Giant Force	GTH-150-40-CP-AR	MAA0512-018	06/05/2024	06/04/2025
Test Software	SGS	Radio Test Software	Ver. 21	N.C.R	N.C.R

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6.2 Radiated Measurement

Test site: SAC 1

Radiated Emission Test Site: SAC 1					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
1.3G High Pass Filter	Woken	WHKX10-1066	19	12/11/2024	12/10/2025
3.2G High Pass Filter	Woken	WHKX10-2624	3	12/11/2024	12/10/2025
4G High Pass Filter	WI	WHKX4.0	23	12/11/2024	12/10/2025
Band Reject Filter 1700-2000	Titan	T04N800100050S0 1	23040703-7	12/11/2024	12/10/2025
Band Reject Filter 2240-2700	Titan	T04N2240270050S 01	23040703-12	12/11/2024	12/10/2025
Band Reject Filter 3300-3900	WI	WRCGV3400/3800- 3300/3900- 40/12SS	1	12/11/2024	12/10/2025
Band Reject Filter 635-920	Titan	T04N63592050S01	23040703-4	12/11/2024	12/10/2025
Bi-log Antenna	SCHWARZBECK	VULB9168	1208	07/17/2024	07/16/2025
Bi-log Antenna	TESEO	CBL 6112D	35242 & AT-N0555	12/09/2024	12/08/2025
Coaxial Cable	EMCI	EMC104-SM-SM- 8000+EMC106-SM- SM-7600	RX Cable 9K- 18G(160125+15081 7)	08/30/2024	08/29/2025
Coaxial Cables	Huber Suhner	SUCOFLEX 102	RX Cable 18G-40G MY2630/2+805062 /2	08/30/2024	08/29/2025
Coaxial Cables	Huber Suhner	SUCOFLEX 102+SUCOFLEX 106	TX Cable 30M-40G 23051/2+76096/6+ 22962/2	08/30/2024	08/29/2025
DC Power Supply	HILA	DP-3003N	11233K1019035	03/24/2025	03/23/2026
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY60242081	10/23/2024	10/22/2025
Horn Antenna	RF SPIN	DRH0844	LE2D05A0844	07/10/2024	07/09/2025
Horn Antenna	SCHWARZBECK	BBHA9120D	603	05/20/2025	05/19/2026
Horn Antenna	SCHWARZBECK	BBHA9120D	D803	01/09/2025	01/08/2026
Horn Antenna	SCHWARZBECK	BBHA9170	184	12/20/2024	12/19/2025
Network Analyzer	Anritsu	MS4644A	1216312	12/25/2024	12/24/2025
Pre-Amplifier	EMCI	EMC118A45SEE	980933	08/30/2024	08/29/2025
Pre-Amplifier	EMCI	EMC184045SEE	9080939	08/30/2024	08/29/2025
Pre-Amplifier	HP	8447D	2944A09469	08/30/2024	08/29/2025
Radio Communication Analyzer	KEYSIGHT	E7515B	MY59321561	07/11/2024	07/10/2025
Site Cal	SGS	SAC 1	N/A	08/30/2024	08/29/2025
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R

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Test site: SAC 2

Radiated Emission Test Site: SAC 2					
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL. (mm/dd/yyyy)	CAL DUE. (mm/dd/yyyy)
4G High Pass Filter	WI	WHKX4.0	23	12/11/2024	12/10/2025
6G High Pass Filter	WI	WHKX6.0	54	12/11/2024	12/10/2025
Band Reject Filter 2240-2700	Titan	T04N2240270050S 01	23040703-12	12/11/2024	12/10/2025
Band Reject Filter 3300-3900	WI	WRCGV3400/3800- 3300/3900- 40/12SS	1	12/11/2024	12/10/2025
Bi-log Antenna	SCHWARZBECK	VULB9168	1208	07/17/2024	07/16/2025
Bi-log Antenna	SCHWARZBECK	VULB9168	9168-1278	03/10/2025	03/09/2026
Coaxial Cables	EMCI	EMC104-SM-SM- 600 +EMC105-SM-SM- 2000 +EMC105-SM-SM- 1500 +EMC105-SM-SM- 10000	RX Cable 9K-18G (220237+220909+2 20906+240801)	08/30/2024	08/29/2025
Coaxial Cables	Huber Suhner	SUCOFLEX 102	RX Cable 18G-40G MY2630/2+805062 /2	08/30/2024	08/29/2025
Coaxial Cables	Huber Suhner	SUCOFLEX 102+SUCOFLEX 106	TX Cable 30M-40G 23051/2+76096/6+ 22962/2	08/30/2024	08/29/2025
DC Power Supply	HILA	DP-3003N	11233K1019035	03/24/2025	03/23/2026
EXA Spectrum Analyzer	KEYSIGHT	N9010B	MY60242392	12/24/2024	12/23/2025
Horn Antenna	SCHWARZBECK	BBHA9120D	603	05/20/2025	05/19/2026
Horn Antenna	RF SPIN	DRH0844	LE2D05A0844	07/10/2024	07/09/2025
Horn Antenna	RF SPIN	DRH18-E	210303A18-ES	02/20/2025	02/19/2026
Horn Antenna	SCHWARZBECK	BBHA9170	184	12/20/2024	12/19/2025
Network Analyzer	Anritsu	MS4644A	1216312	12/25/2024	12/24/2025
Pre-Amplifier	EMCI	EMC118A45SEE	980867	08/30/2024	08/29/2025
Pre-Amplifier	EMCI	EMC184045SEE	9080939	08/30/2024	08/29/2025
Pre-Amplifier	EMCI	EMC330N	980826	08/30/2024	08/29/2025
Radio Communication Analyzer	KEYSIGHT	E7515B	MY59321561	07/11/2024	07/10/2025
Site Cal	SGS	SAC 2	N/A	08/30/2024	08/29/2025
Test Software	Audix	e3	Ver. 9.210616	N.C.R	N.C.R

NOTE: N.C.R refers to Not Calibrated Required.

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7 STANDARD APPLICABLE

7.1 Maximum Output Power

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

7.1.1 ERP/EIRP LIMIT

According to FCC §2.1046

FCC 22.913(a)

(5) mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

FCC 24.232(c)

Mobile and portable stations are limited to 2 W EIRP.

FCC 27.50 (a)

(3) for mobile and portable stations compliant with 3GPP LTE standards transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band are limited to 250 mW/ 5MHz EIRP but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth.

FCC 27.50(c)

(9) Control and mobile stations in the 698-746 MHz band are limited to 30 watts ERP.

FCC 27.50(d)

(4) Mobile, and portable (hand-held) stations operating in the 1710-1755 MHz, 1695-1710 MHz and 1755-1780 MHz bands are limited to 1W EIRP.

FCC 27, 50(h)

(2) Mobile and other user stations transmitting in the BRS and EBS bands are limited to 2 W EIRP.

FCC 27, 50(j)

(3) Mobile and portable stations are limited to 1 Watt EIRP. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

FCC 27, 50(k)

(3) Mobile devices are limited to 1Watt (30 dBm) EIRP. Mobile devices operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

FCC 90.542(a)

(6) Control stations and mobile stations transmitting in the 758-768 MHz band and the 788-798 MHz band are limited to 30 watts ERP.

FCC 90.635(b)

Mobile station is limited to 100W ERP.

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7.2 Occupied Bandwidth Measurement

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

7.3 Out Of Band Emission At Antenna Terminals

FCC §22.917(a), §24.238(a), §27.53(h), §90.543(e)(3)

Out of band emissions. 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.

FCC §27.53(a)

For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:

- (4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:
- (i) By a factor of not less than: $43 + 10 \log(P)$ dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than $55 + 10 \log(P)$ dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than $61 + 10 \log(P)$ dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than $67 + 10 \log(P)$ dB on all frequencies between 2328 and 2337 MHz;
 - (ii) By a factor of not less than $43 + 10 \log(P)$ dB on all frequencies between 2300 and 2305 MHz, $55 + 10 \log(P)$ dB on all frequencies between 2296 and 2300 MHz, $61 + 10 \log(P)$ dB on all frequencies between 2292 and 2296 MHz, $67 + 10 \log(P)$ dB on all frequencies between 2288 and 2292 MHz, and $70 + 10 \log(P)$ dB below 2288 MHz;
 - (iii) By a factor of not less than $43 + 10 \log(P)$ dB on all frequencies between 2360 and 2365 MHz, and not less than $70 + 10 \log(P)$ dB above 2365 MHz.

FCC §27.53(g)

Compliance for operations in the 600 MHz, 698-746 MHz, 746-758 MHz and the 776-788 MHz band with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

FCC §27.53(h)

(h) *AWS emission limits*—(1) *General protection levels*. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

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FCC §27.53(m) (4) (6)

For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

FCC §90.543 (e)

For operations in the 758-768 MHz and the 788-798 MHz bands, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

- (1) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than $76 + 10 \log (P)$ dB in a 6.25 kHz band segment, for base and fixed stations.
- (2) On all frequencies between 769-775 MHz and 799-805 MHz, by a factor not less than $65 + 10 \log (P)$ dB in a 6.25 kHz band segment, for mobile and portable stations.
- (3) On any frequency between 775-788 MHz, above 805 MHz, and below 758 MHz, by at least $43 + 10 \log (P)$ dB.

FCC §90.691 Emission mask requirements for EA-based systems

(a) Out-of-band emission requirement shall apply only to the "outer" channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

- (1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $116 \log_{10}(f/6.1)$ decibels or $50 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz.
- (2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency

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removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz.

7.4 Field Strength Of Spurious Radiation Measurement

According to FCC §2.1053,

FCC §22.917(a), §24.238(a), §27.53(h), §90.543(e)(3)

Out of band emissions. 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.

FCC §27.53(a)

For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in watts, by the following amounts:

- (4) For mobile and portable stations operating in the 2305-2315 MHz and 2350-2360 MHz bands:
 - (ii) By a factor of not less than $70 + 10 \log(P)$ dB below 2288 MHz;
 - (iii) By a factor of not less than $70 + 10 \log(P)$ dB above 2365 MHz.

FCC §27.53(g)

Compliance for operations in the 600 MHz, 698-746 MHz, 746-758 MHz and the 776-788 MHz band with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

- (2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10 \log(P)$ dB;
- (3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $76 + 10 \log(P)$ dB in a 6.25 kHz band segment, for base and fixed stations;
- (4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than $65 + 10 \log(P)$ dB in a 6.25 kHz band segment, for mobile and portable stations;

FCC §90.543 (f)

For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

FCC §27.53(h)(1)

(h) *AWS emission limits*—(1) *General protection levels*. Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least $43 + 10 \log_{10}(P)$ dB.

FCC §27.53(m) (4) (6)

For mobile digital stations, the attenuation factor shall be not less than $40 + 10 \log(P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log(P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log(P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log(P)$ dB on all frequencies between

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2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed; for mobile digital stations, in the 1 megahertz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least two percent may be employed, except when the 1 megahertz band is 2495-2496 MHz, in which case a resolution bandwidth of at least one percent may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 megahertz or 1 percent of emission bandwidth, as specified; or 1 megahertz or 2 percent for mobile digital stations, except in the band 2495-2496 MHz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules.

§90.691 Emission mask requirements for EA-based systems

(a) Out-of-band emission requirement shall apply only to the “outer” channels included in an EA license and to spectrum adjacent to interior channels used by incumbent licensees. The emission limits are as follows:

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

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

7.5 Frequency Stability Measurement

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

7.6 Peak to Average Ratio

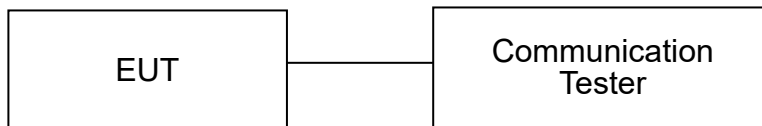
The peak-to-average ratio (PAR) of the transmission may not exceed 13dB.

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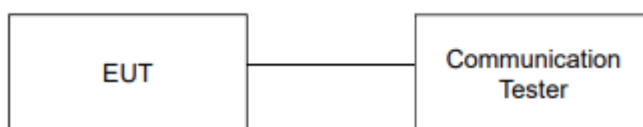
8 TEST SETUP

8.1 Maximum Output Power



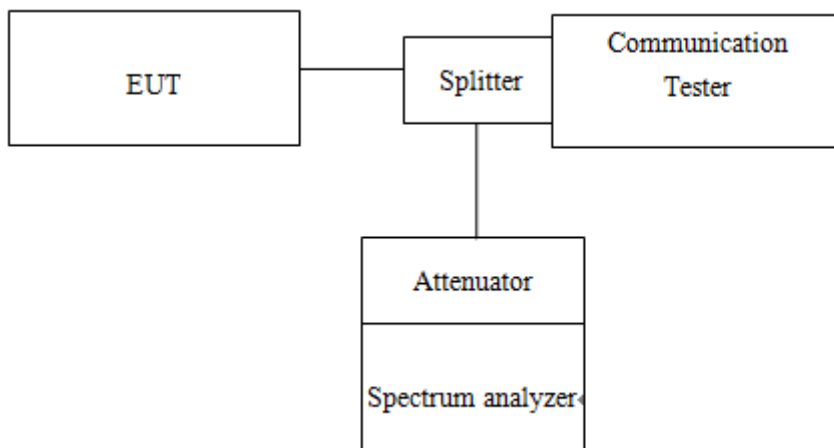
Note: Measurement setup for testing on Antenna connector

8.2 Occupied Bandwidth Measurement



Note: Measurement setup for testing on Antenna connector

8.3 Out of Band Emission At Antenna Terminals

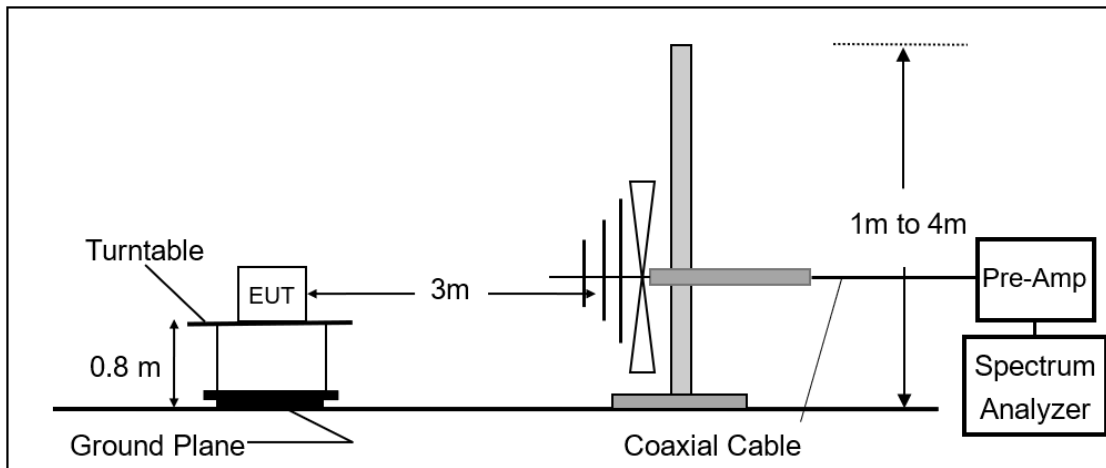


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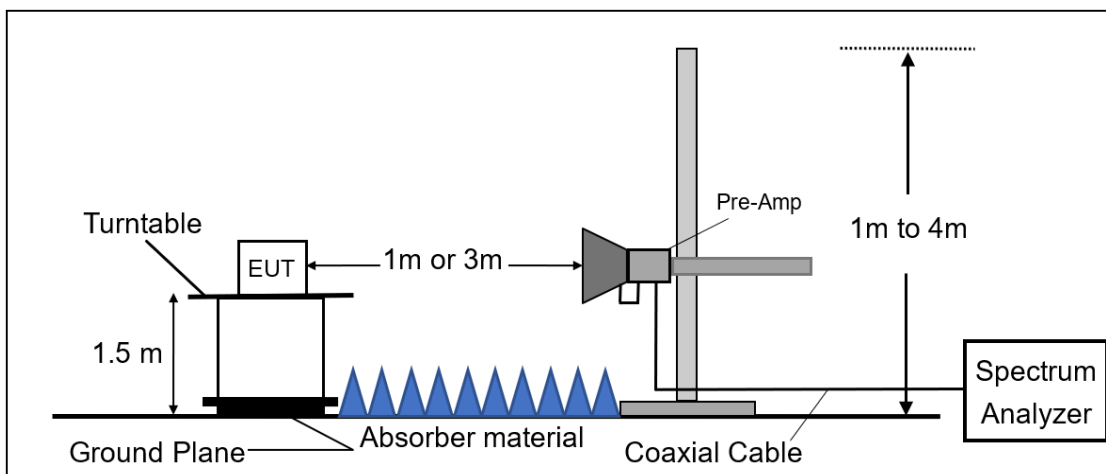
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8.4 Field Strength of Spurious Radiation Measurement

Radiated Emission Test Set-Up, Frequency From 30MHz to 1000MHz.



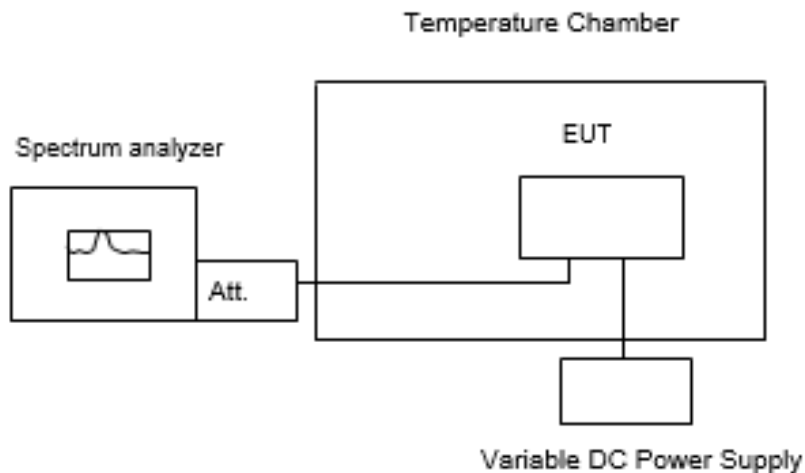
Radiated Emission Test Set-Up, Frequency Above 1GHz.



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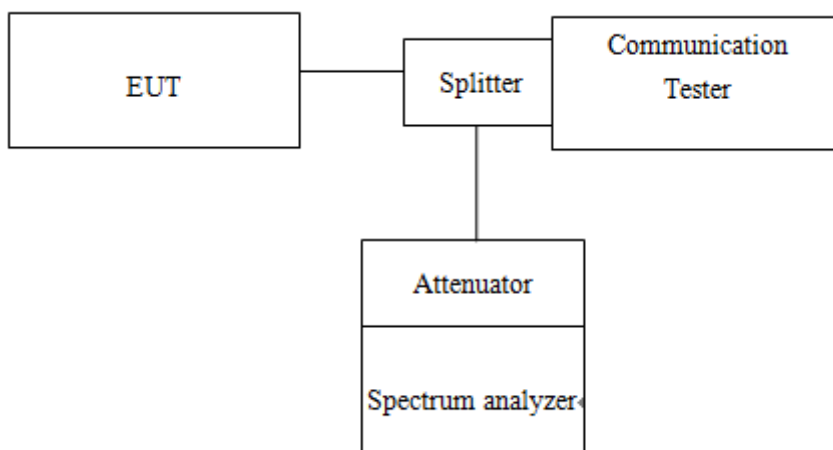
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8.5 Frequency Stability Measurement



Note: Measurement setup for testing on Antenna connector

8.6 Peak To Average Ratio



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9 TEST PROCEDURE

9.1 Maximum Output Power

9.1.1 Output Power Measurement Applicable Guidance

The transmitter output was connected to a communication tester. Transmitter output was read off the communication tester in dBm. The power output at the transmitter antenna port was determined by the communication tester reading.

KDB 971168 D01 Power Meas License Digital System as the supplemental test methodology to adjust the proper setting obtaining the measurement results.

All LTE bands conducted average power is obtained from the simulator telecommunication test set.

9.1.2 Determining ERP and/or EIRP from conducted RF output power measurements

According to KDB 412172 D01 Power Approach,

$$EIRP = P_T + G_T - L_C,$$

$$ERP = EIRP - 2.15,$$

Where:

- ERP or EIRP = effective radiated power or equivalent isotropically radiated power (expressed in the same units as P_T , typically dBW, dBm, or power spectral density (PSD)²), relative to either a dipole antenna (ERP) or an isotropic antenna (EIRP);
- P_T = transmitter output power, expressed in dBW, dBm, or PSD;
- G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
- L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

9.2 Occupied Bandwidth Measurement

99% & 26dB Bandwidth with detector peak

The EUT's output RF connector was connected with a short cable to the spectrum analyzer, RBW was set to about 1% of emission BW, VBW= 3 times RBW, -26dBc display line was placed on the screen (or 26dB bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace. Then set RBW to 99% bandwidth, RBW= 1% ~ 5%, VBW $\geq 3 * RBW$, with span $> 2 * \text{Signal BW}$, set % Power = 99%.

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9.3 Out of Band Emission at Antenna Terminals

9.3.1 Conducted Emission

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz, sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.

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

9.3.2 Band Edge

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

9.4 Field Strength of Spurious Radiation Measurement

The EUT was placed on a non-conductive; the measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

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

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

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

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

9.5 Frequency Stability Measurement

The equipment under test was connected to an external AC or DC power supply and input rated voltage. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators. The EUT was placed inside the temperature chamber. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 20°C operating frequency as reference frequency. Turn EUT off and set the chamber temperature to -30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency. Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached.

Set chamber temperature to 20°C. Use a variable AC power supply / DC power source to power the EUT and set the voltage to rated voltage. Set the spectrum analyzer RBW low

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

9.6 Peak to Average Ratio

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

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10 MEASUREMENT RESULTS

Please refer to the Annex A-Measurement Results.

11 PHOTOGRAPHS OF SET UP

Please refer to the attached file (Setup Photo).

12 PHOTOGRAPHS OF EUT

Please refer to the attached file (EUT Photo).

~ End of Report ~

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