



Certificate Number: 5055.02

TEST REPORT FOR RF TESTING

Report No.: SRTC2021-9004(F)-21082802(N)

Product Name: 5G module

Applicant: Fibocom Wireless Inc.

Manufacturer: Fibocom Wireless Inc.

Specification: FCC Part 2, Part 22H, Part 27, Part 90(2020)

FCC ID: ZMOFG360NA

The State Radio_monitoring_center Testing Center (SRTC)

15th Building, No.30 Shixing Street, Shijingshan District, Beijing, P.R.China

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1. GENERAL INFORMATION

1.1 Notes of the test report

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1.2 Information about the testing laboratory

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Address:	15th Building, No.30 Shixing Street, Shijingshan District, P.R.China
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1.3 Applicant's details

Company:	Fibocom Wireless Inc.
Address:	1101,Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan,Shenzhen, China
Contacted person:	lucy.liu
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Email:	lucy.liu@fibocom.com

1.4 Manufacturer's details

Company:	Fibocom Wireless Inc.
Address:	1101,Tower A, Building 6, Shenzhen International Innovation Valley, Dashi 1st Rd, Nanshan,Shenzhen, China

1.5 Test Environment

Date of Receipt of test sample at SRTC:	2021-08-17	
Testing Start Date:	2021-08-17	
Testing End Date:	2021-10-09	

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient:	25	50
Maximum Extreme:	75	---
Minimum Extreme:	-30	---

Normal Supply Voltage (V d.c.):	3.8
Maximum Extreme Supply Voltage (V d.c.):	4.4
Minimum Extreme Supply Voltage (V d.c.):	3.3

2 DESCRIPTION OF THE EQUIPMENT UNDER TEST

2.1 Final Equipment Build Status

Frequency Range:	NR Band N5: Tx:824~849 MHz Rx:869 ~894MHz NR Band N7: Tx:2500~2570MHz Rx:2620~2690MHz NR Band N12: Tx:699~716 MHz Rx:729~746MHz NR Band N14: Tx:788~798 MHz Rx:758~768MHz NR Band N30: Tx:2305~2315MHz Rx:2350~2360MHz NR Band N77: Tx:3450~3550MHz;3700~3980MHz Rx: 3450~3550MHz;3700~3980MHz NR Band N78: Tx: 3450~3550MHz;3700~3800MHz Rx: 3450~3550MHz;3700~3800MHz
Modulation Type:	DFT-QPSK/DFT-16QAM/ DFT-64QAM/ DFT-256QAM/ CP-QPSK/CP-16QAM/CP-64QAM/CP-256QAM
Antenna Type:	External
Antenna Gain:	N5: 1.61dBi N7: 1.07dBi N12: 1.58dBi N14: 2.19dBi N30: 0.22dBi N77/N78: -2.09dBi
Power Supply:	Charger
Hardware Version:	V1.0
Software Version:	81103.7000.30.02.01.09
IMEI:	861139050018252

Remark: Only the modulation of CP mode supported MIMO.

2.2 Summary table

FCC Rule Part	Frequency Range (MHz)	EIRP/ERP (W)	Frequency Tolerance (ppm)	Emission Designator	BW (MHz)	Measured 26dBc Bandwidth (MHz)	Communication Type
NR BAND N5							
22H	826.5-846.5	0.169	--	4M47G7D	5M	4.86	DFT-QPSK/CP-QPSK
	826.5-846.5	0.134	--	4M48W7D	5M	4.85	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	829-844	0.166	--	8M95G7D	10M	9.22	DFT-QPSK/CP-QPSK
	829-844	0.139	--	9M35W7D	10M	9.59	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	831.5-841.5	0.169	--	14M1G7D	15M	14.98	DFT-QPSK/CP-QPSK
	831.5-841.5	0.139	--	14M1W7D	15M	14.76	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	834-839	0.170	0.00	18M9G7D	20M	19.91	DFT-QPSK/CP-QPSK
	834-839	0.135	--	18M9W7D	20M	19.98	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	NR BAND N7						
27	2502.5-2567.5	0.272	--	4M46G7D	5M	5.04	DFT-QPSK/CP-QPSK
	2502.5-2567.5	0.206	--	4M48W7D	5M	5.03	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	2505-2565	0.254	--	9M28G7D	10M	10.09	DFT-QPSK/CP-QPSK
	2505-2565	0.195	--	9M29W7D	10M	9.88	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	2507.5-2562.5	0.253	--	14M1G7D	15M	15.05	DFT-QPSK/CP-QPSK
	2507.5-2562.5	0.197	--	14M1W7D	15M	14.81	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	2510-2560	0.269	--	19M1G7D	20M	19.87	DFT-QPSK/CP-QPSK
	2510-2560	0.217	--	18M9W7D	20M	19.90	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	2512.5-2557.5	0.255	--	23M7G7D	25M	25.18	DFT-QPSK/CP-QPSK
	2512.5-2557.5	0.242	--	23M7W7D	25M	25.09	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	2515-2555	0.253	--	28M7G7D	30M	29.69	DFT-QPSK/CP-QPSK
	2515-2555	0.205	--	28M6W7D	30M	29.88	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	2520-2550	0.248	--	38M9G7D	40M	39.85	DFT-QPSK/CP-QPSK
	2520-2550	0.196	--	38M9W7D	40M	39.88	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	2525-2545	0.259	0.00	48M7G7D	50M	49.82	DFT-QPSK/CP-QPSK
	2525-2545	0.205	--	48M6W7D	50M	49.70	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM

NR BAND N12							
27	701.5-713.5	0.185	--	4M47G7D	5M	4.81	DFT-QPSK/CP-QPSK
	701.5-713.5	0.172	--	4M47W7D	5M	4.88	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	704-711	0.154	--	9M28G7D	10M	9.99	DFT-QPSK/CP-QPSK
	704-711	0.137	--	9M28W7D	10M	9.84	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	706.5-708.5	0.186	0.00	14MG7D	15M	14.77	DFT-QPSK/CP-QPSK
	706.5-708.5	0.162	--	14M1W7D	15M	14.75	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
NR BAND N14							
90	790.5-795.5	0.215	--	4M48G7D	5M	4.67	DFT-QPSK/CP-QPSK
	790.5-795.5	0.166	--	4M48W7D	5M	4.65	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	793	0.214	0.01	9M01G7D	10M	9.32	DFT-QPSK/CP-QPSK
	793	0.185	--	8M99W7D	10M	9.31	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
NR BAND N30							
27	2307.5-2312.5	0.171	--	4M47G7D	5M	4.97	DFT-QPSK/CP-QPSK
	2307.5-2312.5	0.139	--	4M50W7D	5M	4.93	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	2310	0.174	0.00	8M91G7D	10M	9.73	DFT-QPSK/CP-QPSK
	2310	0.133	--	8M91W7D	10M	9.77	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM

NR BAND N77(3450-3550)							
27	3455.01-3545.01	0.232	--	8M57G7D	10M	9.33	DFT-QPSK/CP-QPSK
	3455.01-3545.01	0.173	--	8M57W7D	10M	9.65	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3457.5-3542.49	0.273	--	13M6G7D	15M	14.35	DFT-QPSK/CP-QPSK
	3457.5-3542.49	0.233	--	13M6W7D	15M	15.10	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3460.02-3540	0.288	--	18M2G7D	20M	19.94	DFT-QPSK/CP-QPSK
	3460.02-3540	0.232	--	18M2W7D	20M	19.48	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3470.01-3530.01	0.292	--	37M8G7D	40M	39.67	DFT-QPSK/CP-QPSK
	3470.01-3530.01	0.231	--	37M8W7D	40M	40.97	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3475.02-3525	0.280	--	47M4G7D	50M	50.15	DFT-QPSK/CP-QPSK
	3475.02-3525	0.243	--	47M4W7D	50M	51.39	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3480-3519.99	0.268	--	57M8G7D	60M	60.11	DFT-QPSK/CP-QPSK
	3480-3519.99	0.211	--	57M9W7D	60M	62.66	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3485.01-3515.01	0.270	--	58M0G7D	70M	61.45	DFT-QPSK/CP-QPSK
	3485.01-3515.01	0.215	--	58M0W7D	70M	64.21	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3490.02-3510	0.273	--	77M3G7D	80M	82.06	DFT-QPSK/CP-QPSK
	3490.02-3510	0.217	--	77M5W7D	80M	84.37	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3495-3504.99	0.272	--	87M3G7D	90M	90.34	DFT-QPSK/CP-QPSK
	3495-3504.99	0.215	--	87M4W7D	90M	92.89	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3500.01	0.272	--	97M3G7D	100M	101.2	DFT-QPSK/CP-QPSK
	3500.01	0.214	--	97M3W7D	100M	103.7	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM

NR BAND N77(3700-3980)							
27	3705-3975	0.283	--	8M56G7D	10M	9.38	DFT-QPSK/CP-QPSK
	3705-3975	0.232	--	8M60W7D	10M	9.85	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3707.52-3972.48	0.295	--	12M9G7D	15M	13.87	DFT-QPSK/CP-QPSK
	3707.52-3972.48	0.240	--	13M6W7D	15M	14.81	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3710.01-3969.99	0.285	--	17M9G7D	20M	19.55	DFT-QPSK/CP-QPSK
	3710.01-3969.99	0.231	--	18M2W7D	20M	19.59	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3720-3960	0.278	--	35M7G7D	40M	37.96	DFT-QPSK/CP-QPSK
	3720-3960	0.236	--	37M8W7D	40M	40.09	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3725.01-3954.99	0.282	--	45M6G7D	50M	48.12	DFT-QPSK/CP-QPSK
	3725.01-3954.99	0.223	--	57M5W7D	50M	50.29	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3730.02-3949.98	0.281	--	57M9G7D	60M	60.58	DFT-QPSK/CP-QPSK
	3730.02-3949.98	0.223	--	57M9W7D	60M	61.70	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3735-3945	0.284	--	64M3G7D	70M	67.72	DFT-QPSK/CP-QPSK
	3735-3945	0.226	--	64M4W7D	70M	68.60	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3740.01-3939.99	0.303	--	77M5G7D	80M	80.18	DFT-QPSK/CP-QPSK
	3740.01-3939.99	0.239	--	77M6W7D	80M	84.82	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3745.02-3934.98	0.301	--	86M6G7D	90M	94.34	DFT-QPSK/CP-QPSK
	3745.02-3934.98	0.240	--	87M5W7D	90M	94.33	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3750-3930	0.296	0.00	96M4G7D	100M	100.5	DFT-QPSK/CP-QPSK
	3750-3930	0.234	--	97M3W7D	100M	102.8	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM

NR BAND N78(3450-3550)							
27	3455.01-3545.01	0.299	--	8M58G7D	10M	10.10	DFT-QPSK/CP-QPSK
	3455.01-3545.01	0.242	--	8M58W7D	10M	10.57	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3457.5-3542.49	0.234	--	13M5G7D	15M	14.43	DFT-QPSK/CP-QPSK
	3457.5-3542.49	0.203	--	13M6W7D	15M	15.67	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3460.02-3540	0.307	--	18M2G7D	20M	19.33	DFT-QPSK/CP-QPSK
	3460.02-3540	0.242	--	18M2W7D	20M	19.44	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3462.51-3537.51	0.318	--	23M2G7D	25M	24.45	DFT-QPSK/CP-QPSK
	3462.51-3537.51	0.260	--	23M2W7D	25M	24.50	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3465-3534.99	0.312	--	28M0G7D	30M	29.29	DFT-QPSK/CP-QPSK
	3465-3534.99	0.252	--	27M9W7D	30M	30.26	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3470.01-3530.01	0.290	--	37M8G7D	40M	40.36	DFT-QPSK/CP-QPSK
	3470.01-3530.01	0.225	--	37M9W7D	40M	40.94	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3475.02-3525	0.316	--	47M4G7D	50M	49.62	DFT-QPSK/CP-QPSK
	3475.02-3525	0.249	--	47M5W7D	50M	50.63	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3480-3519.99	0.284	--	58M1G7D	60M	60.33	DFT-QPSK/CP-QPSK
	3480-3519.99	0.219	--	58M0W7D	60M	61.04	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3485.01-3515.01	0.217	--	58M0G7D	70M	63.67	DFT-QPSK/CP-QPSK
	3485.01-3515.01	0.182	--	58M0W7D	70M	64.49	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3490.02-3510	0.248	--	77M9G7D	80M	81.19	DFT-QPSK/CP-QPSK
	3490.02-3510	0.196	--	77M5W7D	80M	84.06	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3495-3504.99	0.246	--	88M0G7D	90M	90.42	DFT-QPSK/CP-QPSK
	3495-3504.99	0.196	--	87M5W7D	90M	92.99	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3500.01	0.238	0.00	97M4G7D	100M	101.0	DFT-QPSK/CP-QPSK
	3500.01	0.214	--	97M4W7D	100M	101.3	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM

NR BAND N78(3700-3800)							
27	3705-3795	0.322	--	8M58G7D	10M	9.44	DFT-QPSK/CP-QPSK
	3705-3795	0.255	--	8M59W7D	10M	10.07	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3707.52-3792.48	0.316	--	13M6G7D	15M	14.52	DFT-QPSK/CP-QPSK
	3707.52-3792.48	0.253	--	13M6W7D	15M	15.03	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3710.01-3789.99	0.330	--	18M17G7D	20M	19.37	DFT-QPSK/CP-QPSK
	3710.01-3789.99	0.264	--	18M2W7D	20M	19.61	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3712.5-3787.5	0.316	--	23M0G7D	25M	24.67	DFT-QPSK/CP-QPSK
	3712.5-3787.5	0.254	--	23M2W7D	25M	24.53	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3715.02-3785.01	0.314	--	27M8G7D	30M	29.91	DFT-QPSK/CP-QPSK
	3715.02-3785.01	0.251	--	27M9W7D	30M	30.03	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3720-3780	0.313	--	37M7G7D	40M	39.63	DFT-QPSK/CP-QPSK
	3720-3780	0.248	--	37M8W7D	40M	41.25	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3725.01-3774.99	0.315	--	47M4G7D	50M	50.22	DFT-QPSK/CP-QPSK
	3725.01-3774.99	0.251	--	47M4W7D	50M	51.59	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3730.02-3769.98	0.320	--	58M2G7D	60M	61.10	DFT-QPSK/CP-QPSK
	3730.02-3769.98	0.247	--	58M0W7D	60M	61.60	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3735-3765	0.321	--	57M9G7D	70M	63.12	DFT-QPSK/CP-QPSK
	3735-3765	0.253	--	57M9W7D	70M	63.60	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3740.01-3759.99	0.314	--	77M5G7D	80M	82.29	DFT-QPSK/CP-QPSK
	3740.01-3759.99	0.249	--	77M4W7D	80M	83.92	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3745.02-3754.98	0.312	--	87M3G7D	90M	90.46	DFT-QPSK/CP-QPSK
	3745.02-3754.98	0.245	--	87M4W7D	90M	93.68	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM
	3750	0.311	0.00	97M1G7D	100M	101.4	DFT-QPSK/CP-QPSK
	3750	0.247	--	97M2W7D	100M	101.3	DFT-16QAM/DFT-64QAM/ DFT-256QAM/CP-16QAM/ CP-64QAM/CP-256QAM

3 REFERENCE SPECIFICATION

Specification	Version	Title
FCC Part 2	2020	Frequency allocations and radio treaty matters; general rules and regulations
FCC Part 22	2020	Public mobile services
FCC Part 27	2020	Miscellaneous wireless communications services
FCC Part 90	2020	Private land mobile radio services
ANSI C63.26	2015	American national standard for compliance testing of transmitters used in licensed radio services
KDB 971168 D01	April 9, 2018	Measurement guidance for certification of licensed digital transmitters
TIA-603-E-2016	March 2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

4 KEY TO NOTES AND RESULT CODES

The following are the definition of the test result.

Code	Meaning
PASS	Test result shows that the requirements of the relevant specification have been met.
FAIL	Test result shows that the requirements of the relevant specification have not been met.
NT	Normal Temperature
NV	Nominal voltage
HV	High voltage
LV	Low voltage

5 RESULT SUMMARY

No.	Test case	FCC reference	Verdict
1	RF Power Output	2.1046	Pass
2	Effective Radiated Power and Effective Isotropic Radiated Power	22.913(a)(5), 27.50(b)(10), 27.50(c)(10), 27.50(h)(2), 27.50(d)(4), 27.50(a)(3), 27.50(j) , 27.50(k)(3), 90.205	Pass
3	Occupied Bandwidth	2.1049	Pass
4	Peak-Average Ratio	24.232(d), 27.50(d)(5), 27.50(k)(4)	Pass
5	Emission Bandwidth	2.1049	Pass
6	Spurious Emissions at antenna terminals	2.1051, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(m), 27.53(a), 27.53(l), 27.50(n), 90.543(e)	Pass
7	Band Edges Compliance	2.1051, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(m), 27.53(a) 27.53(o), 27.53(l2), 27.50(n)(2)	Pass
8	Frequency Stability	2.1055, 22.355, 24.235, 27.54, 90.213	Pass
9	Radiated Spurious Emissions	2.1053, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(f), 27.53(a), 27.53(l),27.53(m) 27.53(o), 27.50(n)(2) 90.543(e)	NA

This Test Report Is Issued by: Mr. Peng Zhen 	Checked by: Ms. Liu Jia 
Tested by: Mr. Li Bin 	Issued date: 2021-10-09

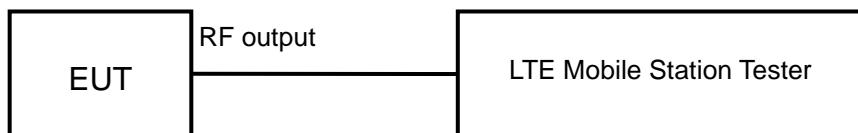
6 TEST RESULT

6.1 RF Power Output

Rule Part(s)

FCC: 2.1046

Test Setup:



Test procedure:

After a radio link has been established between EUT and Tester, the output power of the cell signal of the testing equipment will be decreased until the output power of the EUT reach a maximum value. Then the test data can be read at the tester screen. The loss between RF output port of the EUT and the input port of the tester will be taken into consideration.

Limits: No RF Power Output requirements in part 2.1046.

Test result:

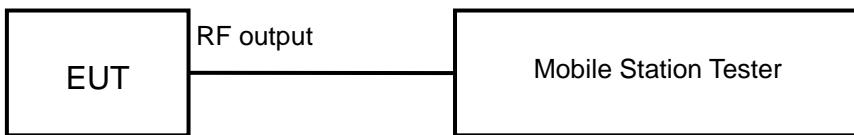
The test results are shown in Appendix A.

6.2 Effective Radiated Power and Effective Isotropic Radiated Power

Rule Part(s)

FCC: 22.913(a) (5), 24.232(c), 27.50(b) (10), 27.50(c) (10), 27.50(h) (2), 27.50(d) (4), 27.50(a) (3) , 90.205

Test setup:



Test procedure:

KDB 971168 D01 v03r01 – Section 5.6

Test Settings

Subclause 5.2.5.5 of ANSI C63.26-2015 is applicable, along with the following provisions. For personal/portable radios utilizing an integral antenna, the factor LC is typically negligible. However, in a fixed station transmit system that utilizes a long cable run between the transmitter and the transmitting antenna, this factor can be significant. The minimum cable loss should be used in this equation.

The relevant equation for determining the ERP or EIRP from the conducted RF output power measured is:

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

Where:

ERP/EIRP = effective or equivalent radiated power, respectively (expressed in the same units as PMes, typically dBW or dBm)

PMes = measured transmitter output power or PSD, in dBW or dBm

LC = signal attenuation in the connecting cable between the transmitter and antenna in dB

GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP)

ERP/EIRP LIMIT

This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15dB) and known input power. ERP can be calculated from EIRP by subtracting the gain of the dipole, $\text{ERP} = \text{EIRP} - 2.15$ (dB).

22.913(a) (5)

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

24.232(c)

Mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

27.50(b) (10)

Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

27.50(c) (10)

Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

27.50(h) (2)

Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

27.50(d) (4)

Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands

are limited to 1 watt EIRP. Fixed stations operating in the 1710-1755 MHz band are limited to a maximum antenna height of 10 meters above ground. Mobile and portable stations operating in these bands must employ a means for limiting power to the minimum necessary for successful communications.

27.50(a) (3)

Mobile and portable stations (i) For mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth.

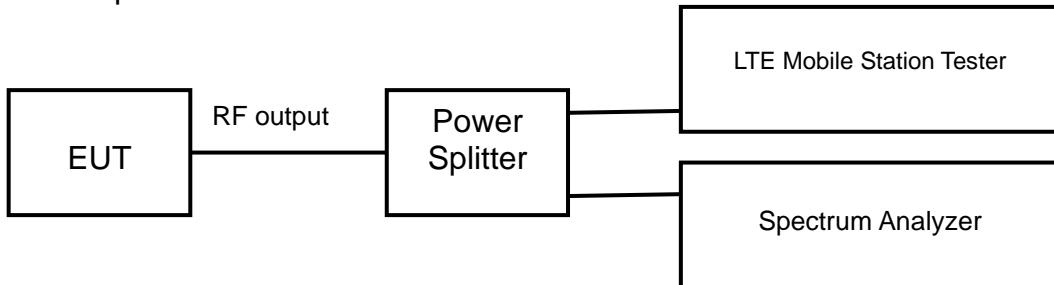
Test result:

The test results are shown in Appendix B.

6.3 Occupied Bandwidth

Rule Part(s)
FCC: 2.1049

Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 4.2

Test Setting:

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW \geq 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

Limits: No specific occupied bandwidth requirements in part 2.1049

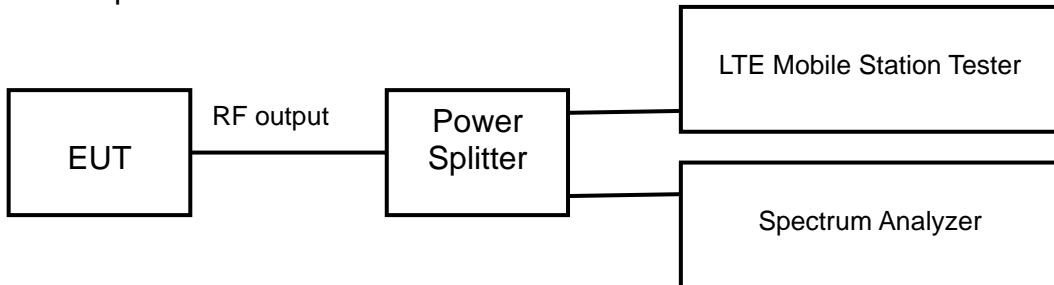
Test result:

The test results are shown in Appendix A.

6.4 Emission Bandwidth

Rule Part(s)
FCC: 2.1049

Test Setup:



Test procedure:
KDB 971168 D01 v03r01 – Section 4.2

Test Setting:

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW \geq 3 x RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of 26dB bandwidth observed in Step 7

Limits: No specific emission bandwidth requirements in part 2.1049.

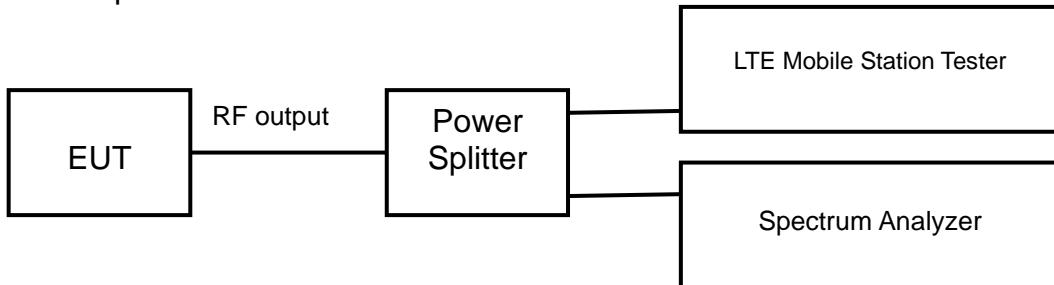
Test result:
The test results are shown in Appendix A.

6.5 Peak-Average Ratio

Rule Part(s)

FCC: 24.232(d), 27.50(d) (5)

Test Setup:



Test procedure:

KDB 971168 D01 v03r01 – Section 5.7.1

Test Setting:

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW \geq OBW or specified reference bandwidth
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Limits

24.232(d), 27.50(d) (5)

In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

Test result:

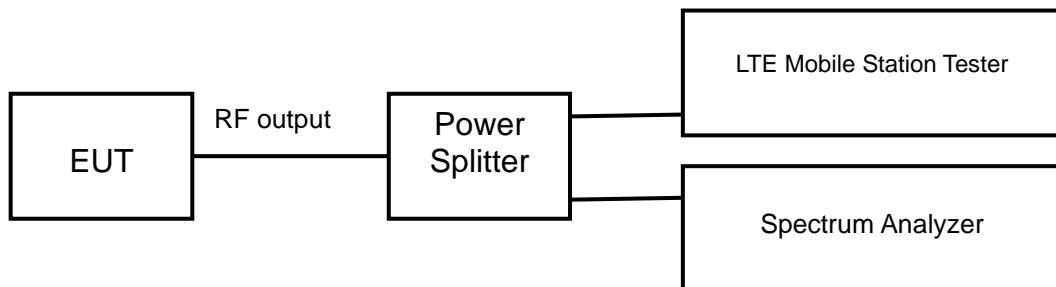
The test results are shown in Appendix A.

6.6 Spurious Emissions at antenna terminal

Rule Part(s)

FCC: 2.1051, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(m), 27.53(a), 90.543(e)

Test Setup:



Test procedure:

KDB 971168 D01 v03r01 – Section 6.0

Test Setting:

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency
2. Detector = RMS
3. RBW=1MHz
4. VBW=3MHz
5. Trace mode = trace average for continuous emissions, max hold for pulse emissions
6. Sweep time = auto couple
7. The trace was allowed to stabilize

Limits

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P)$ (P [Watts]), where P is the transmitter power in Watts.

For Band 30, the minimum permissible attenuation level of any spurious emission <2288MHz and >2365MHz is $70 + \log_{10}(P)$ (P [Watts]).

For Band 7 and 41, the minimum permissible attenuation level of any spurious emission is $55 + \log_{10}(P)$ (P [Watts]).

Test result:

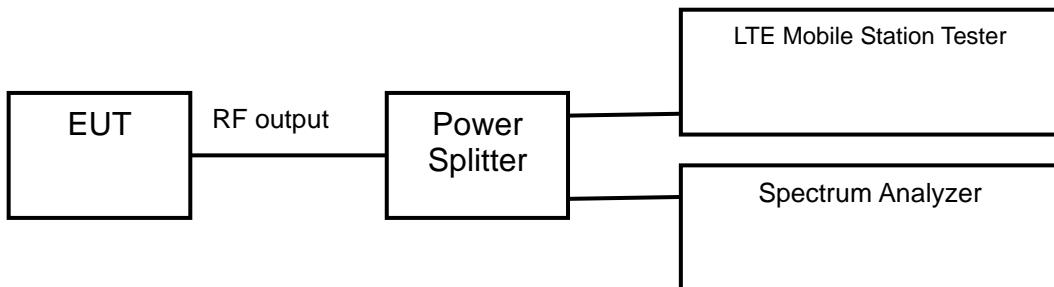
The test results are shown in Appendix A.

6.7 Band Edges Compliance

Rule Part(s)

FCC: 2.1051, 22.917(a), 24.238(a), 27.53(c), 27.53(g), 27.53(h), 27.53(m), 27.53(a)

Test Setup:



Test procedure:

KDB 971168 D01 v03r01 – Section 6.0

Test Setting:

1. Start and stop frequency were set such that the band edge would be placed in the center of the plot
2. Span was set large enough so as to capture all out of band emissions near the band edge
3. RBW > 1% of the emission bandwidth
4. VBW > 3 x RBW
5. Detector = RMS
6. Number of sweep points $\geq 2 \times \text{Span}/\text{RBW}$
7. Trace mode = trace average for continuous emissions, max hold for pulse emissions
8. Sweep time = auto couple
9. The trace was allowed to stabilize

Limits

The minimum permissible attenuation level of any spurious emission is $43 + \log_{10}(P)$ (P [Watts]), where P is the transmitter power in Watts.

The minimum permissible attenuation level for Band 30 is $> 43 + 10\log_{10}(P)$ (P [Watts]) at 2300-2305MHz & 2345-2360MHz, $> 55 + 10\log_{10}(P)$ (P [Watts]) at 2320-2324MHz & 2341-2345MHz, $> 61 + 10\log_{10}(P)$ (P [Watts]) at 2324-2328MHz & 2337-2341MHz, $> 67 + 10\log_{10}(P)$ (P [Watts]) at 2288-2292MHz & 2328-2337MHz, and $> 70 + 10\log_{10}(P)$ (P [Watts]) at frequencies $< 2288\text{MHz}$ & $> 2365\text{MHz}$.

Per 22.917(b) 24.238(a) 27.53(h) 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 to demonstrate compliance with the out-of-band emissions limit. 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 emission are attenuated at least 26 dB below the transmitter power.

Per 27.53(g) for operations in the 698-746 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may be employed to demonstrate compliance with the out-of-band emissions limit.

Per 27.53(c)(5) for operations in the 776-788 MHz band, in the 100 kHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least 30 kHz may

be employed to demonstrate compliance with the out-of-band emissions limit.

For all plots showing emissions in the 763 – 775MHz and 793 – 805MHz band, the FCC limit per 27.53(c)(4) is $65 + 10\log_{10}(P) = -35\text{dBm}$ in a 6.25kHz bandwidth.

Per 27.53(a)(5) in the 1 MHz bands immediately outside and adjacent to the channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter 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 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.

Per 27.53(m) for operations in the BRS/EBS bands, 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. 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 2490.5MHz.

Test result:

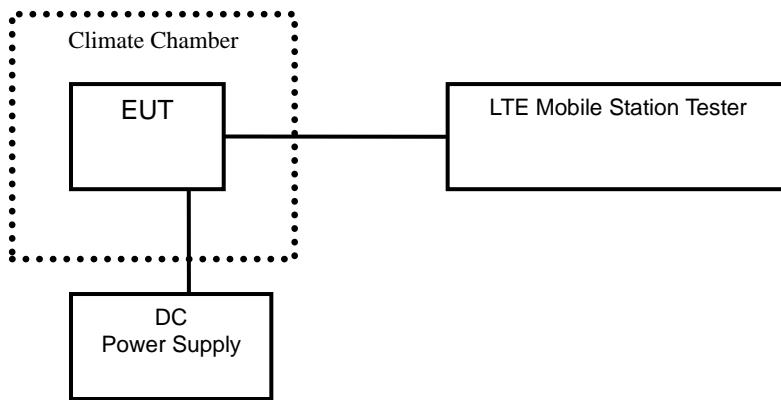
The test results are shown in Appendix A.

6.8 Frequency Stability

Rule Part(s)

FCC: 2.1055, 22.355, 24.235, 27.54, 90.213

Test setup:



Test Procedure:

ANSI/TIA-603-E-2016

Test Settings

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).
2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C (The temperature range can be declared by the manufacturer). A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

Limits: For Part 22, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency. For Part 24, Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

Test result:

The test results are shown in Appendix A.

7 MEASUREMENT UNCERTAINTIES

Items	Uncertainty	
RF Power Output	0.6 dB	
Effective Radiated Power and Effective Isotropic Radiated Power	0.6 dB	
Occupied Bandwidth	3kHz	
Emission Bandwidth	3kHz	
Peak-Average Ratio	0.8dB	
Frequency Stability	48Hz	
Band Edges Compliance	1.2dB	
Spurious Emissions at antenna terminal	9kHz~2GHz	1.2dB
	2G~3.6GHz	1.4dB
	3.6G~8GHz	2.2dB
	8G~12.75GHz	2.7dB

8 TEST EQUIPMENTS

No.	Name/Model	Manufacturer	S/N	Calibration Date	Calibration Due Date
1	Mobile Station Tester / MT8820C	Anritsu	6201300660	2021.06.21	2022.06.20
2	Radio Communication Station / CMW500	R&S	161702	2021.06.21	2022.06.20
3	Radio Communication Station / SP9500	StarPoint	20334	2021.4.12	2022.4.11
4	Spectrum Analyzer / FSV40	R&S	101065	2021.06.21	2022.06.20
5	Spectrum Analyzer / FSW	R&S	101581	2021.02.19	2022.02.18
6	Spectrum Analyzer / N9020A	Agilent	MY48010771	2021.05.18	2022.05.17
7	Power Divider / 11667A	HP	19632	2021.06.21	2022.06.20
8	DC Power Supply / E3645A	Agilent	MY40000741	2021.04.22	2022.04.21
9	Temperature chamber / SH241	ESPEC	92013758	2021.06.21	2022.06.20
10	Fully-Anechoic Chamber / 12.65mx8.03mx7.50m	FRANKONIA	-----	-----	-----
11	Semi-Anechoic/Chamber / 23.18mx16.88mx9.60m	FRANKONIA	---	-----	-----
12	Turn table Diameter:1m	FRANKONIA	-----	-----	-----
13	Turn table Diameter:5m	FRANKONIA	-----	-----	-----
14	Antenna master FAC(MA4.0)	MATURO	-----	-----	-----
15	Antenna master SAC(MA4.0)	MATURO	-----	-----	-----
16	Shielding room / 9.080mx5.255mx3.525m	FRANKONIA	-----	-----	-----
17	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100512	2021.06.21	2022.06.20
18	Double-Ridged Waveguide Horn Antenna / HF 907	R&S	100513	2021.06.21	2022.06.20
19	Ultra log antenna / HL562	R&S	100016	2021.06.21	2022.06.20
20	Receive antenna /3160-09	SCHWARZ-BECK	002058-002	2021.06.21	2022.06.20
21	EMI test receiver / ESI 40	R&S	100015	2021.06.21	2022.06.20
22	EMI test receiver / ESCS30	R&S	100029	2021.06.21	2022.06.20
23	Receive antenna / HL562	R&S	100167	2021.06.21	2022.06.20
24	AMN / ENV216	R&S	3560.6550.12	2021.06.21	2022.06.20

APPENDIX A – TEST DATA OF CONDUCTED EMISSION

Please refer to the attachment.