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FCC 5G mmWave REPORT

Certification

Applicant Name:
SAMSUNG Electronics Co., Ltd.

Address:
129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea

Date of Issue:
May 13, 2022

Test Site/Location:
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA

Report No.: HCT-RF-2205-FC018

FCC ID:	**A3LSMG990U2**
APPLICANT:	**SAMSUNG Electronics Co., Ltd.**
Model:	SM-G990U2
Additional Model:	SM-G990U3/DS
EUT Type:	Mobile phone
Frequency Range:	27.5 GHz ~ 28.35 GHz, 37 GHz ~ 40 GHz
Modulation type:	PI/2 BPSK(DFT-s Only), QPSK, 16QAM, 64QAM
FCC Classification:	Part 30 Mobile Transmitter (5GM)
FCC Rule Part(s):	Part 30
Test Procedure(s):	ANSI C63.26-2015, KDB 971168 D01 v03r01, KDB 842590 D01 V01r02

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of the FCC Rules under normal use and maintenance.

REVIEWED BY

Report prepared by : Beom Jin Cho
Engineer of Telecommunication Testing Center

Report approved by : Jong Seok Lee
Manager of Telecommunication Testing Center

This test results were applied only to the test methods required by the standard.

This laboratory is not accredited for the test results marked *.
The above Test Report is the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2205-FC018	May 13, 2022	- First Approval Report

Table of Contents

1. EUT DESCRIPTION

Model	SM-G990U2
Additional Model	SM-G990U3/DS
EUT Type	Mobile Phone
Power Supply	DC 3.88 V
Date(s) of Tests	April 13, 2022 ~ May 13, 2022
Band	n261: 27,500 MHz ~ 28,350 MHz(TDD) n260: 37,000 MHz ~ 40,000 MHz(TDD)
Channel Bandwidths	50 MHz/100 MHz
Carrier Specification	1CC, 2CC
Multiple transmit	SISO, SISO Dual, MIMO
Channel	Low, Mid, High
SCS	60 kHz, 120 kHz
OFDM	CP-OFDM, DFT-s-OFDM
RB size	1 RB(Offset: low, mid, high), half RB, Full RB
Modulation	PI/2 BPSK(DFT-s Only), QPSK, 16QAM, 64QAM
Antenna Specification	Antenna Designation - K patch: module 0 - L patch: module 1 Antenna Size - 23.8 mm x 3.5 mm x 2.04 mm

1.1 MAXIMUM EIRP POWER

n261 Band								
Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
					(W)	(dBm)		
SISO	K patch: module 0	50	1	27500 - 28350	0.417	26.20	47M1G7D	BPSK
SISO	K patch: module 0	50	1	27500 - 28350	0.410	26.13	47M0G7D	QPSK
SISO	K patch: module 0	50	1	27500 - 28350	0.259	24.13	46M8W7D	16QAM
SISO	K patch: module 0	50	1	27500 - 28350	0.160	22.04	47M0W7D	64QAM
SISO Dual	K patch: module 0	50	1	27500 - 28350	0.490	26.90	47M1G7D	BPSK
SISO Dual	K patch: module 0	50	1	27500 - 28350	0.383	25.83	47M3G7D	QPSK
SISO Dual	K patch: module 0	50	1	27500 - 28350	0.241	23.82	47M0W7D	16QAM
SISO Dual	K patch: module 0	50	1	27500 - 28350	0.150	21.76	46M8W7D	64QAM
SISO	K patch: module 0	50	2	27500 - 28350	0.191	22.82	96M1G7D	BPSK
SISO	K patch: module 0	50	2	27500 - 28350	0.190	22.78	95M8G7D	QPSK
SISO	K patch: module 0	50	2	27500 - 28350	0.127	21.05	96M0W7D	16QAM
SISO	K patch: module 0	50	2	27500 - 28350	0.080	19.04	95M8W7D	64QAM
SISO Dual	K patch: module 0	50	2	27500 - 28350	0.153	21.86	96M1G7D	BPSK
SISO Dual	K patch: module 0	50	2	27500 - 28350	0.198	22.96	95M8G7D	QPSK
SISO Dual	K patch: module 0	50	2	27500 - 28350	0.134	21.28	95M9W7D	16QAM
SISO Dual	K patch: module 0	50	2	27500 - 28350	0.081	19.06	95M7W7D	64QAM
SISO	K patch: module 0	100	1	27500 - 28350	0.416	26.19	91M6G7D	BPSK
SISO	K patch: module 0	100	1	27500 - 28350	0.419	26.22	91M3G7D	QPSK
SISO	K patch: module 0	100	1	27500 - 28350	0.249	23.97	91M3W7D	16QAM
SISO	K patch: module 0	100	1	27500 - 28350	0.148	21.71	91M6W7D	64QAM
SISO Dual	K patch: module 0	100	1	27500 - 28350	0.486	26.87	92M0G7D	BPSK
SISO Dual	K patch: module 0	100	1	27500 - 28350	0.530	27.24	91M8G7D	QPSK
SISO Dual	K patch: module 0	100	1	27500 - 28350	0.318	25.02	92M0W7D	16QAM
SISO Dual	K patch: module 0	100	1	27500 - 28350	0.194	22.87	92M1W7D	64QAM
SISO	K patch: module 0	100	2	27500 - 28350	0.177	22.48	191MG7D	BPSK
SISO	K patch: module 0	100	2	27500 - 28350	0.177	22.49	191MG7D	QPSK
SISO	K patch: module 0	100	2	27500 - 28350	0.128	21.08	191MW7D	16QAM
SISO	K patch: module 0	100	2	27500 - 28350	0.077	18.88	192MW7D	64QAM
SISO Dual	K patch: module 0	100	2	27500 - 28350	0.191	22.82	191MG7D	BPSK

n261 Band								
Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
					(W)	(dBm)		
SISO Dual	K patch: module 0	100	2	27500 - 28350	0.181	22.58	191MG7D	QPSK
SISO Dual	K patch: module 0	100	2	27500 - 28350	0.132	21.21	191MW7D	16QAM
SISO Dual	K patch: module 0	100	2	27500 - 28350	0.081	19.11	191MW7D	64QAM
SISO	L patch: module 1	50	1	27500 - 28350	0.406	26.09	46M9G7D	BPSK
SISO	L patch: module 1	50	1	27500 - 28350	0.393	25.94	47M1G7D	QPSK
SISO	L patch: module 1	50	1	27500 - 28350	0.242	23.83	46M8W7D	16QAM
SISO	L patch: module 1	50	1	27500 - 28350	0.143	21.55	46M9W7D	64QAM
SISO Dual	L patch: module 1	50	1	27500 - 28350	0.236	23.73	47M2G7D	BPSK
SISO Dual	L patch: module 1	50	1	27500 - 28350	0.234	23.69	47M3G7D	QPSK
SISO Dual	L patch: module 1	50	1	27500 - 28350	0.151	21.80	47M0W7D	16QAM
SISO Dual	L patch: module 1	50	1	27500 - 28350	0.092	19.63	46M9W7D	64QAM
SISO	L patch: module 1	50	2	27500 - 28350	0.167	22.24	96M3G7D	BPSK
SISO	L patch: module 1	50	2	27500 - 28350	0.168	22.25	96M3G7D	QPSK
SISO	L patch: module 1	50	2	27500 - 28350	0.115	20.59	96M1W7D	16QAM
SISO	L patch: module 1	50	2	27500 - 28350	0.070	18.46	96M5W7D	64QAM
SISO Dual	L patch: module 1	50	2	27500 - 28350	0.106	20.25	96M2G7D	BPSK
SISO Dual	L patch: module 1	50	2	27500 - 28350	0.112	20.49	95M9G7D	QPSK
SISO Dual	L patch: module 1	50	2	27500 - 28350	0.077	18.85	96M0W7D	16QAM
SISO Dual	L patch: module 1	50	2	27500 - 28350	0.047	16.74	96M1W7D	64QAM
SISO	L patch: module 1	100	1	27500 - 28350	0.385	25.85	91M9G7D	BPSK
SISO	L patch: module 1	100	1	27500 - 28350	0.383	25.83	91M8G7D	QPSK
SISO	L patch: module 1	100	1	27500 - 28350	0.232	23.65	92M3W7D	16QAM
SISO	L patch: module 1	100	1	27500 - 28350	0.151	21.80	92M3W7D	64QAM
SISO Dual	L patch: module 1	100	1	27500 - 28350	0.242	23.84	92M1G7D	BPSK
SISO Dual	L patch: module 1	100	1	27500 - 28350	0.241	23.82	92M4G7D	QPSK
SISO Dual	L patch: module 1	100	1	27500 - 28350	0.151	21.80	92M1W7D	16QAM
SISO Dual	L patch: module 1	100	1	27500 - 28350	0.106	20.24	92M2W7D	64QAM
SISO	L patch: module 1	100	2	27500 - 28350	0.164	22.14	191MG7D	BPSK
SISO	L patch: module 1	100	2	27500 - 28350	0.163	22.12	191MG7D	QPSK
SISO	L patch: module 1	100	2	27500 - 28350	0.114	20.55	191MW7D	16QAM

n261 Band								
Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
					(W)	(dBm)		
SISO	L patch: module 1	100	2	27500 - 28350	0.073	18.66	192MW7D	64QAM
SISO Dual	L patch: module 1	100	2	27500 - 28350	0.119	20.76	191MG7D	BPSK
SISO Dual	L patch: module 1	100	2	27500 - 28350	0.120	20.78	191MG7D	QPSK
SISO Dual	L patch: module 1	100	2	27500 - 28350	0.083	19.21	191MW7D	16QAM
SISO Dual	L patch: module 1	100	2	27500 - 28350	0.052	17.18	191MW7D	64QAM

n260 Band								
Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
					(W)	(dBm)		
SISO	K patch: module 0	50	1	37000 - 40000	0.480	26.81	47M1G7D	BPSK
SISO	K patch: module 0	50	1	37000 - 40000	0.481	26.82	47M4G7D	QPSK
SISO	K patch: module 0	50	1	37000 - 40000	0.309	24.90	47M2W7D	16QAM
SISO	K patch: module 0	50	1	37000 - 40000	0.178	22.51	47M4W7D	64QAM
SISO Dual	K patch: module 0	50	1	37000 - 40000	0.661	28.20	47M2G7D	BPSK
SISO Dual	K patch: module 0	50	1	37000 - 40000	0.700	28.45	47M3G7D	QPSK
SISO Dual	K patch: module 0	50	1	37000 - 40000	0.448	26.51	47M2W7D	16QAM
SISO Dual	K patch: module 0	50	1	37000 - 40000	0.301	24.79	47M1W7D	64QAM
SISO	K patch: module 0	50	2	37000 - 40000	0.222	23.46	96M9G7D	BPSK
SISO	K patch: module 0	50	2	37000 - 40000	0.225	23.53	97M1G7D	QPSK
SISO	K patch: module 0	50	2	37000 - 40000	0.148	21.70	97M0W7D	16QAM
SISO	K patch: module 0	50	2	37000 - 40000	0.096	19.81	98M4W7D	64QAM
SISO Dual	K patch: module 0	50	2	37000 - 40000	0.270	24.31	96M8G7D	BPSK
SISO Dual	K patch: module 0	50	2	37000 - 40000	0.301	24.78	96M7G7D	QPSK
SISO Dual	K patch: module 0	50	2	37000 - 40000	0.209	23.21	96M8W7D	16QAM
SISO Dual	K patch: module 0	50	2	37000 - 40000	0.125	20.97	97M4W7D	64QAM
SISO	K patch: module 0	100	1	37000 - 40000	0.492	26.92	92M7G7D	BPSK
SISO	K patch: module 0	100	1	37000 - 40000	0.462	26.65	92M8G7D	QPSK
SISO	K patch: module 0	100	1	37000 - 40000	0.320	25.05	92M9W7D	16QAM
SISO	K patch: module 0	100	1	37000 - 40000	0.158	22.00	94M0W7D	64QAM
SISO Dual	K patch: module 0	100	1	37000 - 40000	0.665	28.23	92M2G7D	BPSK
SISO Dual	K patch: module 0	100	1	37000 - 40000	0.640	28.06	92M5G7D	QPSK
SISO Dual	K patch: module 0	100	1	37000 - 40000	0.418	26.21	92M5W7D	16QAM
SISO Dual	K patch: module 0	100	1	37000 - 40000	0.252	24.02	93M1W7D	64QAM
SISO	K patch: module 0	100	2	37000 - 40000	0.214	23.31	191MG7D	BPSK
SISO	K patch: module 0	100	2	37000 - 40000	0.211	23.25	191MG7D	QPSK
SISO	K patch: module 0	100	2	37000 - 40000	0.135	21.31	193MW7D	16QAM
SISO	K patch: module 0	100	2	37000 - 40000	0.086	19.32	191MW7D	64QAM
SISO Dual	K patch: module 0	100	2	37000 - 40000	0.290	24.62	192MG7D	BPSK
SISO Dual	K patch: module 0	100	2	37000 - 40000	0.274	24.38	194MG7D	QPSK

n260 Band								
Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
					(W)	(dBm)		
SISO Dual	K patch: module 0	100	2	37000 - 40000	0.201	23.04	192MW7D	16QAM
SISO Dual	K patch: module 0	100	2	37000 - 40000	0.121	20.83	196MW7D	64QAM
SISO	L patch: module 1	50	1	37000 - 40000	0.267	24.27	47M1G7D	BPSK
SISO	L patch: module 1	50	1	37000 - 40000	0.278	24.44	47M2G7D	QPSK
SISO	L patch: module 1	50	1	37000 - 40000	0.184	22.64	47M1W7D	16QAM
SISO	L patch: module 1	50	1	37000 - 40000	0.086	19.32	47M4W7D	64QAM
SISO Dual	L patch: module 1	50	1	37000 - 40000	0.320	25.05	47M1G7D	BPSK
SISO Dual	L patch: module 1	50	1	37000 - 40000	0.348	25.42	47M3G7D	QPSK
SISO Dual	L patch: module 1	50	1	37000 - 40000	0.239	23.79	47M3W7D	16QAM
SISO Dual	L patch: module 1	50	1	37000 - 40000	0.186	22.69	47M5W7D	64QAM
SISO	L patch: module 1	50	2	37000 - 40000	0.114	20.58	96M3G7D	BPSK
SISO	L patch: module 1	50	2	37000 - 40000	0.115	20.59	96M6G7D	QPSK
SISO	L patch: module 1	50	2	37000 - 40000	0.077	18.87	96M3W7D	16QAM
SISO	L patch: module 1	50	2	37000 - 40000	0.047	16.69	96M1W7D	64QAM
SISO Dual	L patch: module 1	50	2	37000 - 40000	0.176	22.45	96M5G7D	BPSK
SISO Dual	L patch: module 1	50	2	37000 - 40000	0.165	22.18	96M5G7D	QPSK
SISO Dual	L patch: module 1	50	2	37000 - 40000	0.121	20.84	96M2W7D	16QAM
SISO Dual	L patch: module 1	50	2	37000 - 40000	0.065	18.14	96M9W7D	64QAM
SISO	L patch: module 1	100	1	37000 - 40000	0.400	26.02	92M8G7D	BPSK
SISO	L patch: module 1	100	1	37000 - 40000	0.338	25.29	92M7G7D	QPSK
SISO	L patch: module 1	100	1	37000 - 40000	0.229	23.60	93M1W7D	16QAM
SISO	L patch: module 1	100	1	37000 - 40000	0.156	21.93	94M4W7D	64QAM
SISO Dual	L patch: module 1	100	1	37000 - 40000	0.329	25.17	92M4G7D	BPSK
SISO Dual	L patch: module 1	100	1	37000 - 40000	0.364	25.61	92M6G7D	QPSK
SISO Dual	L patch: module 1	100	1	37000 - 40000	0.204	23.09	92M9W7D	16QAM
SISO Dual	L patch: module 1	100	1	37000 - 40000	0.136	21.34	93M6W7D	64QAM
SISO	L patch: module 1	100	2	37000 - 40000	0.167	22.23	191MG7D	BPSK
SISO	L patch: module 1	100	2	37000 - 40000	0.161	22.08	191MG7D	QPSK
SISO	L patch: module 1	100	2	37000 - 40000	0.114	20.55	191MW7D	16QAM
SISO	L patch: module 1	100	2	37000 - 40000	0.072	18.58	192MW7D	64QAM

n260 Band								
Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
					(W)	(dBm)		
SISO Dual	L patch: module 1	100	2	37000 - 40000	0.168	22.25	192MG7D	BPSK
SISO Dual	L patch: module 1	100	2	37000 - 40000	0.159	22.01	193MG7D	QPSK
SISO Dual	L patch: module 1	100	2	37000 - 40000	0.110	20.40	193MW7D	16QAM
SISO Dual	L patch: module 1	100	2	37000 - 40000	0.058	17.61	194MW7D	64QAM

2. FACILITIES AND ACCREDITATIONS

2.1. FACILITIES

The SAC(Semi-Anechoic Chamber) and conducted measurement facility used to collect the radiated data are located at the 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 (Version: 2014) and CISPR Publication 22.

Seoicheon-ro
■ Semi Chamber 1
□ Semi Chamber 2
□ Semi Chamber 3
■ mmWave Chamber

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary for radiated emissions measurements in the spurious domain. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its fuction as a ground plane. An 80cm tall test table made of Styrodur is placed on top of the turn table. A Styrodur pedestal is placed on top of the table to bring the total table height to 1.5m for measurements above 1GHz.
Radiated spurious emission measurements from 30MHz - 18GHz were performed in a semi anechoic chamber (SAC) conforming to the site validation requirements.
Radiated power (EIRP) measurements were performed according to ANSI C63.26_2015 in a full anechoic chamber (FAC).

The test facility has been recognised by the FCC under registration number KR0032. The full scope of recognition can be viewed at https://apps.fcc.gov/oetcf/eas/reports/ViewTestFirmAccredScopes.cfm?calledFromFrame=N&RequestTimeout=500&regnum_specified=N&test_firm_id=5749.

2.2. EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

3. TEST SPECIFICATIONS

FCC Rule Parts	47 CFR FCC Part2, Part 30
Measurement standards	ANSI C63.26-2015, KDB 971168 D01 v03r01, KDB 662911 D01 v02r01, KDB 662911 D02 v01, KDB 842590 D01 v01r02

Note:

The EUT was tested per the guidance of ANSI C63.26-2015, KDB 971168 D01 v03r01, KDB 842590 D01 v01r02

EIRP Simulation data for all Beam IDs was used to determine the worst case Beam ID for SISO operation and Beam ID pair for SISO Dual operation. These Beam ID's was used for final measurements.

All testing was performed using FTM software at continuous Tx operation(100 % duty cycle).
In case of RSE for EN-DC mode, we used 5G NR call simulator.

Each of the patch antennas is comprised of two separate antenna feeds(H/V).

All modulations, RB size, CP-OFDM, DFT-s-OFDM and SCS were investigated and the worst case configuration results are reported.

In cases of SISO, SISO Dual, MIMO, CP-OFDM is supported.
In cases of SISO, SISO Dual, DFT-s-OFDM mode is supported.
Both CP-OFDM and DFT-s-OFDM were invegtiged for the Occupied Bandwidth, EIRP, Band Edge, RSE and the DFT-s-OFDM was worst case of NR Modulations in all test cases.

Per 2.1057(a)(2), spurious emissions were investigated up to 200 GHz.(up to 100 GHz for n261 band)

The radiated RF output power, band edge and all out-of-band emissions in the spurious domain are evaluated to the EIRP limits.

In case of band edge, if the band edge results does not comply the EIRP limit, the band edge results are converted to an equivalent conductive power by subtracting the known antenna gain from the EIRP measured at each frequency of interest. These emissions are compared to the 30.203 spurious emission limits as conductive power levels.

Beam IDs were selected based on which Beam ID produces the highest EIRP during EIRP simulation.

The radiated spurious emission was investigated in three orthogonal orientation x, y and z.
(worst case: y for n261, y for n260)

3.1. STANDARDS & TEST SUMMARY

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 2, Part 30

Description	Test Limit	Reference	Results
Occupied Bandwidth	N/A	§2.1049	Compliant
Equivalent Isotropic Radiated Power	43 dBm	§30.202 §30.202	Compliant
Out-of-Band Emissions at the Band Edge	-13 dBm/MHz for all out-of-band emissions, -5 dBm/MHz from the band edge up to 10 % of the channel BW	§2.1051, §30.203	Compliant
Radiated Spurious Emissions	-13 dBm/MHz for all out-of-band emissions	§2.1051, §30.203	Compliant
Frequency Stability	Fundamental emissions stay within authorized frequency block	§2.1055	Compliant

3.2. HIGHEST E.I.R.P POSITION

K patch: module 0 SISO

Band	CH	Beam ID	SISO - H	Beam ID	SISO - V
n261	Low	159	H / Azi : 91 Roll : 148	20	V / Azi : 87 Roll : 191
	Mid	159	H / Azi : 72 Roll : 149	20	V / Azi : 77 Roll : 193
	High	159	H / Azi : 84 Roll : 151	20	V / Azi : 92 Roll : 186
n260	Low	162	V / Azi : 71 Roll : 206	33	H / Azi : 87 Roll : 173
	Mid	152	V / Azi : 78 Roll : 198	23	H / Azi : 89 Roll : 162
	High	161	V / Azi : 91 Roll : 181	23	H / Azi : 86 Roll : 157

K patch: module 0 SISO Dual, MIMO

Band	CH	Beam ID	SISO Dual - H	Beam ID	SISO Dual - V
n261	Low	31/159	H / Azi : 91 Roll : 152	31/159	V / Azi : 41 Roll : 139
	Mid	19/147	H / Azi : 87 Roll : 214	19/147	V / Azi : 63 Roll : 205
	High	31/159	H / Azi : 71 Roll : 152	31/159	V / Azi : 49 Roll : 106
n260	Low	33/161	H / Azi : 91 Roll : 176	33/161	V / Azi : 89 Roll : 163
	Mid	33/161	H / Azi : 73 Roll : 184	33/161	V / Azi : 92 Roll : 178
	High	34/162	H / Azi : 56 Roll : 213	34/162	V / Azi : 86 Roll : 206

L patch: module 1 SISO

Band	CH	Beam ID	SISO - H	Beam ID	SISO - V
n261	Low	154	H / Azi : 74 Roll : 2	36	V / Azi : 73 Roll : 325
	Mid	153	H / Azi : 93 Roll : 27	36	V / Azi : 57 Roll : 328
	High	162	H / Azi : 93 Roll : 14	34	V / Azi : 73 Roll : 12
n260	Low	156	V / Azi : 73 Roll : 4	27	H / Azi : 91 Roll : 33
	Mid	164	V / Azi : 76 Roll : 11	29	H / Azi : 86 Roll :342
	High	156	V / Azi : 86 Roll : 4	38	H / Azi : 91 Roll : 324

L patch: module 1 SISO Dual, MIMO

Band	CH	Beam ID	SISO Dual - H	Beam ID	SISO Dual - V
n261	Low	36/164	H / Azi : 84 Roll : 327	36/164	V / Azi : 91 Roll : 328
	Mid	35/163	H / Azi : 91 Roll : 343	35/163	V / Azi : 72 Roll : 347
	High	35/163	H / Azi : 87 Roll : 342	35/163	V / Azi : 77 Roll : 347
n260	Low	27/155	H / Azi : 93 Roll : 28	27/155	V / Azi : 73 Roll : 24
	Mid	36/164	H / Azi : 86 Roll : 9	36/164	V / Azi : 77 Roll : 19
	High	36/164	H / Azi : 87 Roll : 11	36/164	V / Azi : 72 Roll : 34

3.3. MAXIMUM MEASUREMENT UNCERTAINTY

The value of the measurement uncertainty for the measurement of each parameter.

Coverage factor k = 2, Confidence levels of 95 %

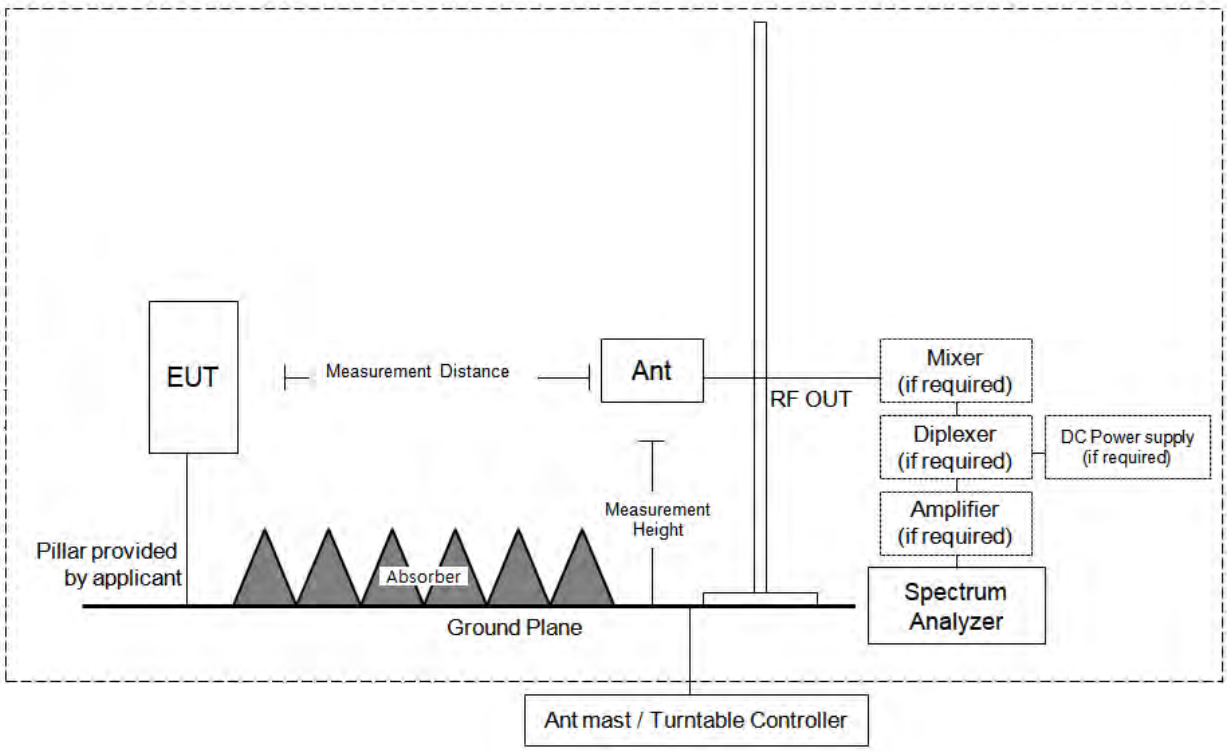
Description	Condition	Uncertainty
Occupied Bandwidth	-	± 0.31 MHz
Equivalent Isotropic Radiated Power	27.48 GHz ~ 28.37 GHz, 36.98 GHz ~ 40.02 GHz	± 5.05 dB
Band Edge		
Radiated Spurious Emissions	9 kHz ~ 30 MHz	± 4.40 dB
	30 MHz ~ 1 GHz	± 5.74 dB
	1 GHz ~ 18 GHz	± 5.51 dB
	18 GHz ~ 40 GHz	± 5.92 dB
	40 GHz ~ 200 GHz	± 5.48 dB
Frequency Stability	-	69.61 kHz

3.4. STANDARDS ENVIRONMENTAL TEST CONDITIONS

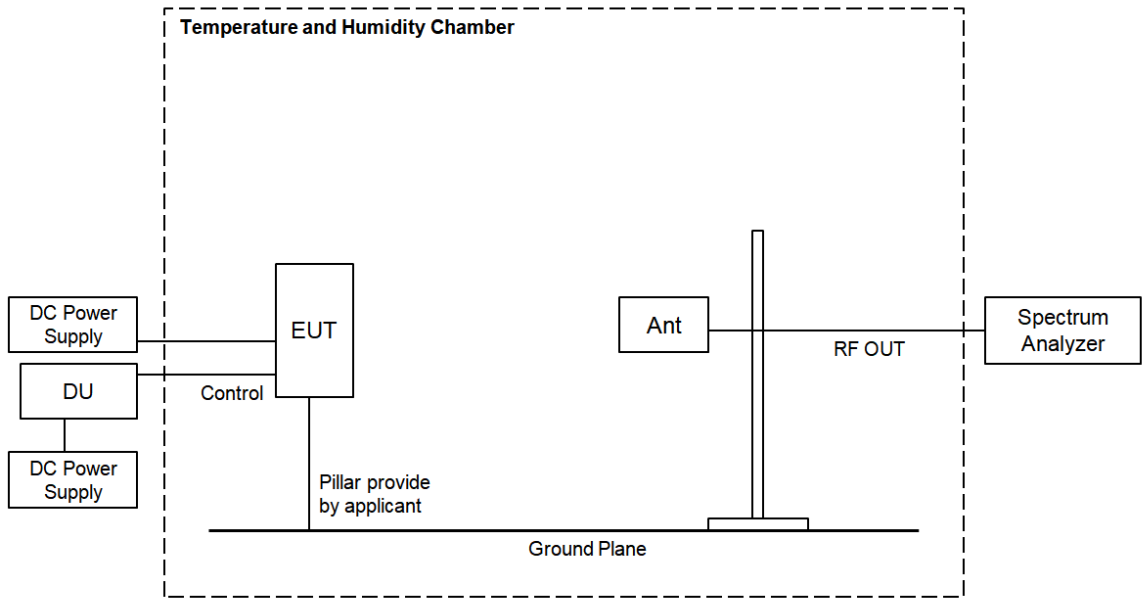
Temperature:	+15 ℃ to +35 ℃
Relative humidity:	30 % to 60 %
Air pressure:	860 mbar to 1 060 mbar

3.5. TEST DIAGRAMS

Occupied Bandwidth / EIRP / Band Edge / RSE



Frequency stability



3.6. ADDITIONAL DESCRIPTIONS ABOUT TEST

- All tests is performed by radiated measurement and applied below conditions.

: Used measurement distance with far field of test such as EIRP, OBW and Band edge are as follow.

Wavelength = Speed of light / Measurement frequency = 30 / 4 000 = 0.0075

(2 X (Max measured antenna dimension) ^{2}) / Wavelength = (2 X (0.09604686)^2)/ 0.0075= ***2.46 m***

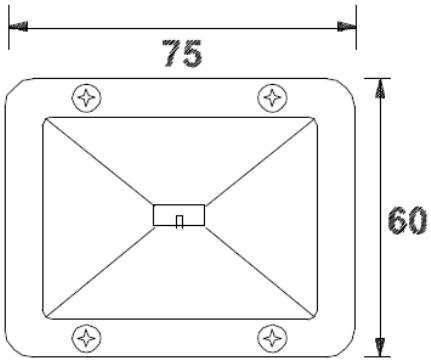
: Spurious emissions measurement distance is shown in table below(Reference : Measurement Antenna Dimension).

Frequency Rage (GHz)	Wavelength (cm)	Far Field Distance (m)	Measurement Distance(m)
18 ~ 40	0.75	2.46	3.00
40 ~ 60	0.50	1.354	1.50
60 ~90	0.33	0.856	1.00
90 ~ 140	0.214	0.572	1.00
140 ~ 200	0.15	0.332	0.50

- Unwanted radiated emissions test was performed on state of all EUT antenna path is operated with a maximum output power level.

- In case of far-field distance for fundamental, we applied the measured antenna dimension because the measured antenna is bigger than the antenna of EUT.

- Dimension of measured(BBHA 9170) antenna: 0.096046 m



- Dimension of EUT antenna : 0.024142 m

- Below 18 GHz, measurement distance is 3.00 m.

4. TEST EQUIPMENTS

Manufacturer	Model / Equipment	Due to Calibration	Calibration Interval	Serial No.
Agilent	N9030B / PXA Signal Analyzer	10/22/2022	Annual	MY60070602
Schwarzbeck	BBHA 9170 / Horn Antenna	11/16/2023	Biennial	BBHA9170541
KIKUSUI	PWR800L / DC Power Supply	07/13/2022	Annual	RE002047
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4640/800-XP-EP / Antenna Position Tower	N/A	N/A	N/A
Rohde&Schwarz	FSW / Spectrum Analyzer	11/11/2022	Annual	101256
Rohde&Schwarz	FSP / Spectrum Analyzer	09/13/2022	Annual	836650/016
Schwarzbeck	Loop Antenna	06/04/2023	Biennial	1513-175
Emco	2090 / Controller	N/A	N/A	060520
Ets	Turn Table	N/A	N/A	N/A
Schwarzbeck	VULB 9168 / Hybrid Antenna	09/04/2022	Biennial	9168-0895
Schwarzbeck	BBHA 9120D / Horn Antenna	01/18/2024	Biennial	9120D-1300
OML INC.	M19RH / Horn Antenna	03/14/2023	Annual	18042301
OML INC.	M19RH / Horn Antenna	03/14/2023	Annual	18042302
OML INC.	M12RH / Horn Antenna	03/14/2023	Annual	18042301
OML INC.	M12RH / Horn Antenna	03/14/2023	Annual	18042302
OML INC.	M08RH / Horn Antenna	03/15/2023	Annual	18050101
OML INC.	M08RH / Horn Antenna	03/15/2023	Annual	18050102
OML INC.	M05RH / Horn Antenna	03/15/2023	Annual	18050101
OML INC.	M05RH / Horn Antenna	03/15/2023	Annual	18050102
VDI	WR19SAX / Spectrum Analyzer Extension Module	03/16/2023	Annual	SAX771
VDI	WR12SAX / Spectrum Analyzer Extension Module	03/17/2023	Annual	SAX773
VDI	WR8.0SAX / Spectrum Analyzer Extension Module	03/17/2023	Annual	SAX779
VDI	WR5.1SAX / Spectrum Analyzer Extension Module	03/17/2023	Annual	SAX774
OML INC.	WR-19 / Source Module	09/02/2022	Annual	S19MS-A-160516-1
OML INC.	WR-12 / Source Module	09/02/2022	Annual	S12MS-A-160419-1
OML INC.	WR-08 / Source Module	09/02/2022	Annual	S08MS-A-160419-1
OML INC.	WR-05 / Source Module	09/07/2022	Annual	S05MS-A-160419-1
NANGYEUL CO., LTD.	NY-THR18750 / Temperature and Humidity Chamber	02/10/2023	Annual	NY-200912201A
Rohde & Schwarz	SMV100A / Signal Generator	07/05/2022	Annual	177633
Keysight	E7515B / UXM 5G Wireless Test Platform	01/04/2023	Annual	MY58300756
T&M SYSTEM	FBSR-04C / LNA1 thru(100M-18G)	09/16/2022	Annual	NONE

Note:

1. Equipment listed above that calibrated during the testing period was set for test after the calibration.

2. Equipment listed above that has a calibration due date during the testing period, the testing is completed before equipment expiration date.

5. TEST RESULT

5.1. OCCUPIED BANDWIDTH

FCC Rules

Test Requirements:

§ 2.1049 Measurements required: Occupied bandwidth.

The occupied bandwidth, that 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 radiated by a given emission shall be measured under the specified conditions of § 2.1049 (a) through (i) as applicable. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Procedures:

The measurement is performed in accordance with Section 5.4.3 and 5.4.4 of ANSI C63.26.

5.4.3 Occupied bandwidth—Relative measurement procedure

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the spectrum analyzer shall be wide enough to see sufficient roll off of the signal to make the measurement.

b) The nominal RBW shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × RBW.

c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.

NOTE—Step a), step b), and step c) may require iteration to adjust within the specified tolerances.

d) The dynamic range of the spectrum analyzer at the selected RBW shall be more than 10 dB below the target "−X dB" requirement, i.e., if the requirement calls for measuring the −26 dB OBW, the spectrum analyzer noise floor at the selected RBW shall be at least 36 dB below the reference level.

e) Set spectrum analyzer detection mode to peak, and the trace mode to max hold.

f) Determine the reference value by either of the following:

1) Set the EUT to transmit a modulated signal. Allow the trace to stabilize. Set the spectrum analyzer marker to the highest level of the displayed trace (this is the reference value).

2) Set the EUT to transmit an unmodulated carrier. Set the spectrum analyzer marker to the level of the carrier.

g) Determine the "−X dB amplitude" as equal to (Reference Value − X). Alternatively, this calculation can be performed on the spectrum analyzer using the delta-marker measurement function.

h) If the reference value was determined using an unmodulated carrier, turn the EUT modulation on, then either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise the trace from step f) shall be used for step i).

i) Place two markers, one at the lowest and the other at the highest frequency of the envelope of the spectral display such that each marker is at or slightly below the "−X dB amplitude" determined in step f). If a marker is below this "−X dB amplitude" value it should be as close as possible to this value. The OBW is the positive frequency difference between the two markers. The spectral envelope can cross the "−X dB amplitude" at multiple points. The lowest or highest frequency shall be selected as the frequencies that are the farthest away from the center frequency at which the spectral envelope crosses the "−X dB amplitude."

j) The OBW shall be reported by providing plot(s) of the measuring instrument display, to include markers depicting the relevant frequency and amplitude information (e.g., marker table). The frequency and amplitude axis and scale shall be clearly labeled. Tabular data may be reported in addition to the plot(s).

5.4.4 Occupied bandwidth—Power bandwidth (99%) measurement procedure

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The

frequency span for the spectrum analyzer shall be set wide enough to capture all modulation products including the emission skirts (typically a span of 1.5 × OBW is sufficient).

b) The nominal IF filter 3 dB bandwidth (RBW) shall be in the range of 1% to 5% of the anticipated OBW, and the VBW shall be set ≥ 3 × RBW.

c) Set the reference level of the instrument as required to prevent the signal amplitude from exceeding the maximum spectrum analyzer input mixer level for linear operation. See guidance provided in 4.2.3.

NOTE—Step a), step b), and step c) may require iteration to adjust within the specified tolerances.

d) Set the detection mode to peak, and the trace mode to max-hold.

e) If the instrument does not have a 99% OBW function, recover the trace data points and sum directly in linear power terms. Place the recovered amplitude data points, beginning at the lowest frequency, in a running sum until 0.5% of the total is reached. Record that frequency as the lower OBW frequency. Repeat the process until 99.5% of the total is reached and record that frequency as the upper OBW frequency. The 99% power OBW can be determined by computing the difference these two frequencies.

f) The OBW shall be reported and plot(s) of the measuring instrument display shall be provided with the test report. The frequency and amplitude axis and scale shall be clearly labeled. Tabular data can be reported in addition to the plot(s).

Test Results:

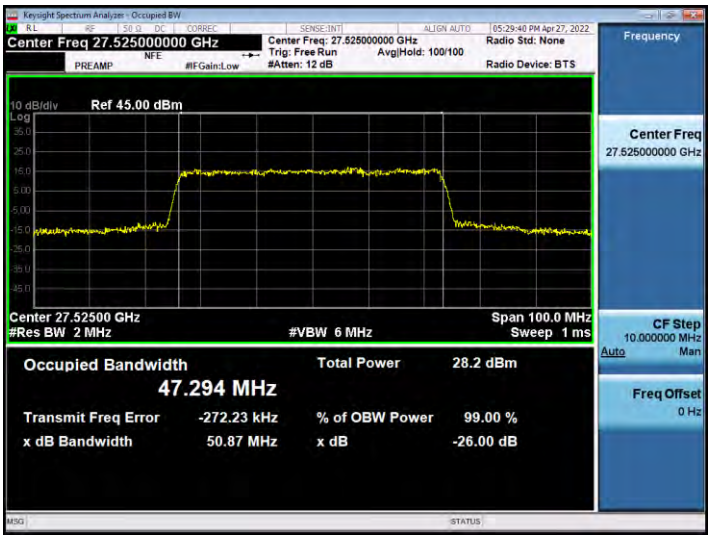
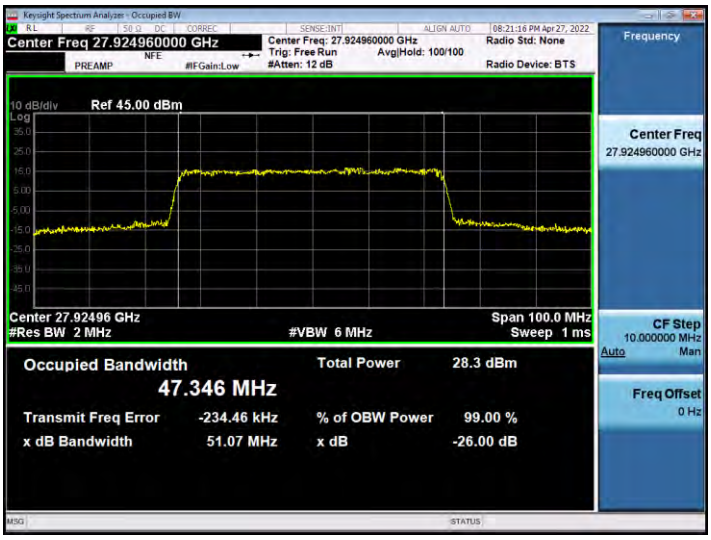
Tabular Data of Occupied Bandwidth

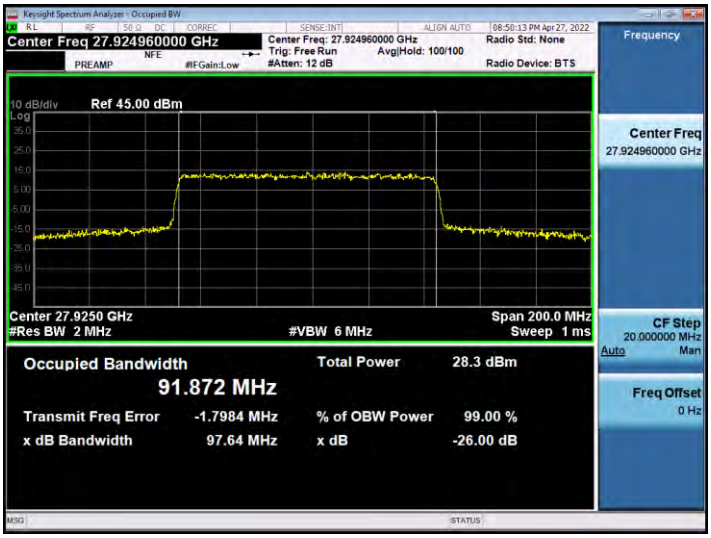
Band	Antenna	CCs Active	Bandwidth	Modulation	Channel	Frequency [MHz]	OBW [MHz]
n261	0(K patch)	1	50 MHz	BPSK	Low	27525.00	47.294
					Mid	27924.96	47.346
					High	28324.92	47.242
			100 MHz	QPSK	Low	27550.08	91.838
					Mid	27924.96	91.872
					High	28299.96	91.785
		2	50 MHz	QPSK	Low	27525.00	95.831
					Mid	27900.00	96.012
					High	28274.88	95.962
			100 MHz	BPSK	Low	27550.08	191.05
					Mid	27874.92	191.17
					High	28200.00	191.23
	1(L patch)	1	50 MHz	QPSK	Low	27525.00	47.256
					Mid	27924.96	47.315
					High	28324.92	47.260
			100 MHz	BPSK	Low	27550.08	92.432
					Mid	27924.96	92.213
					High	28299.96	92.075
		2	50 MHz	QPSK	Low	27525.00	96.008
					Mid	27900.00	95.919
					High	28274.88	95.971
			100 MHz	QPSK	Low	27550.08	190.79
					Mid	27874.92	190.52
					High	28200.00	191.01

Band	Antenna	CCs Active	Bandwidth	Modulation	Channel	Frequency [MHz]	OBW [MHz]
n260	0(K patch)	1	50 MHz	QPSK	Low	37025.04	47.458
					Mid	38499.96	47.169
					High	39975.00	47.348
			100 MHz	BPSK	Low	37050.00	93.062
					Mid	38499.96	92.353
					High	39949.92	92.218
		2	50 MHz	QPSK	Low	37025.04	96.713
					Mid	38474.88	96.361
					High	39924.96	96.713
			100 MHz	BPSK	Low	37050.00	192.20
					Mid	38449.92	191.49
					High	39849.96	192.41
	1(L patch)	1	50 MHz	QPSK	Low	37025.04	47.403
					Mid	38499.96	47.342
					High	39975.00	47.732
			100 MHz	QPSK	Low	37050.00	92.554
					Mid	38499.96	92.639
					High	39949.92	93.583
		2	50 MHz	BPSK	Low	37025.04	96.241
					Mid	38474.88	96.510
					High	39924.96	97.498
			100 MHz	BPSK	Low	37050.00	191.54
					Mid	38449.92	192.08
					High	39849.96	193.13

Plot Data of RF Occupied Bandwidth

1. K patch: module 0, n261

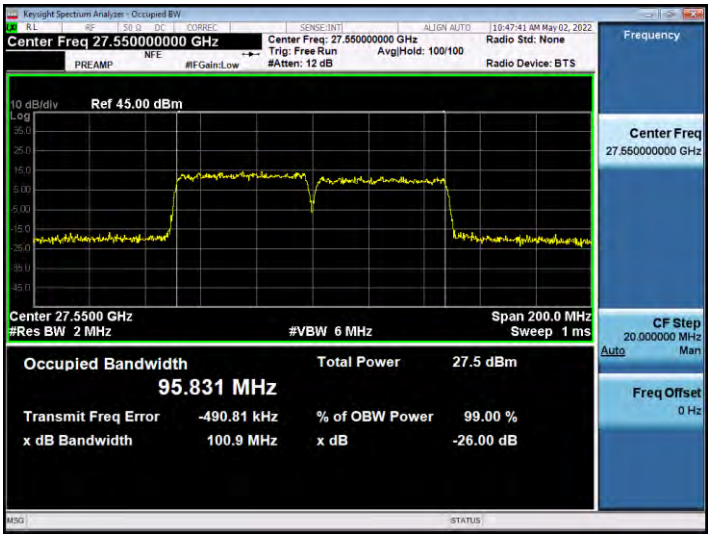
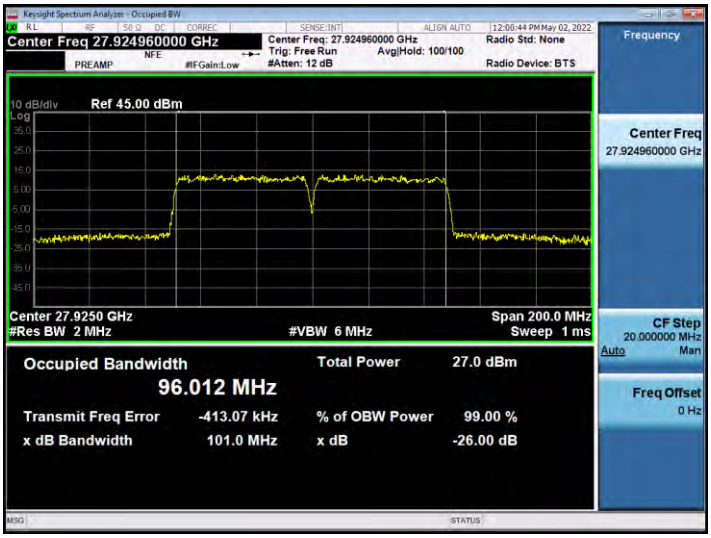
50 MHz, 1CC	
	
	

100 MHz, 1CC	
	
	

Keysight Spectrum Analyzer - Occupied BW
Center Freq 27.550080000 GHz
Center Freq: 27.550080000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 27.5501 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
91.838 MHz
Total Power 29.2 dBm
Transmit Freq Error -1.6963 MHz
% of OBW Power 99.00 %
x dB Bandwidth 97.37 MHz
x dB -26.00 dB
Frequency
Center Freq
27.550080000 GHz
CF Step
20.000000 MHz
Auto Man
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 27.924960000 GHz
Center Freq: 27.924960000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 27.9250 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
91.872 MHz
Total Power 28.3 dBm
Transmit Freq Error -1.7984 MHz
% of OBW Power 99.00 %
x dB Bandwidth 97.64 MHz
x dB -26.00 dB
Frequency
Center Freq
27.924960000 GHz
CF Step
20.000000 MHz
Auto Man
Freq Offset
0 Hz

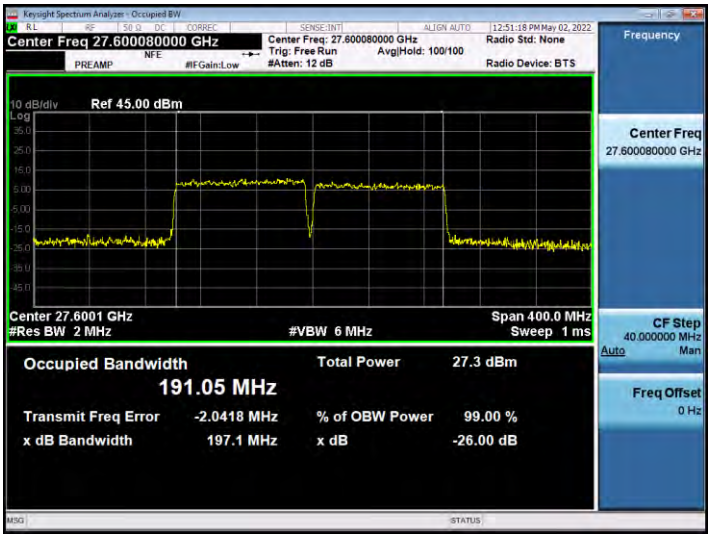
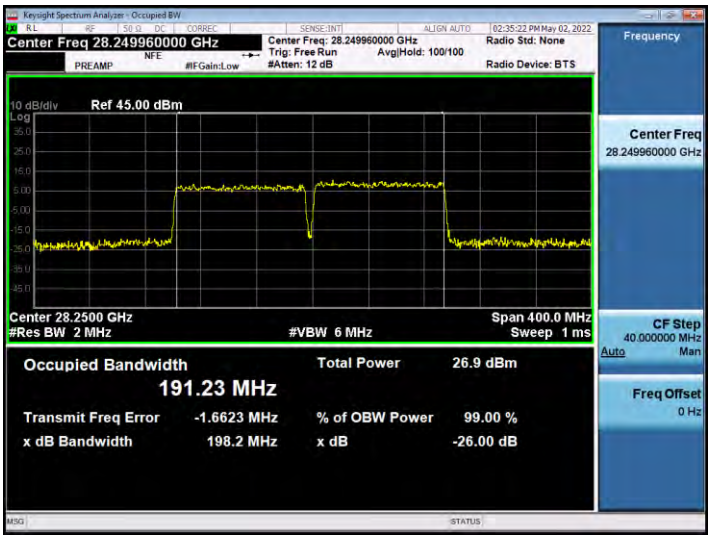
Keysight Spectrum Analyzer - Occupied BW
Center Freq 28.299960000 GHz
Center Freq: 28.299960000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 28.3000 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
91.785 MHz
Total Power 28.8 dBm
Transmit Freq Error -1.8406 MHz
% of OBW Power 99.00 %
x dB Bandwidth 97.30 MHz
x dB -26.00 dB
Frequency
Center Freq
28.299960000 GHz
CF Step
20.000000 MHz
Auto Man
Freq Offset
0 Hz

50 MHz, 2CC	
	
	

Keysight Spectrum Analyzer - Occupied BW
Center Freq 27.550000000 GHz
Center Freq: 27.550000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 27.5500 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
95.831 MHz
Total Power 27.5 dBm
Transmit Freq Error -490.81 kHz
% of OBW Power 99.00 %
x dB Bandwidth 100.9 MHz
x dB -26.00 dB
Frequency
Center Freq
27.550000000 GHz
CF Step
20.000000 MHz
Auto Man
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 27.924960000 GHz
Center Freq: 27.924960000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 27.9250 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
96.012 MHz
Total Power 27.0 dBm
Transmit Freq Error -413.07 kHz
% of OBW Power 99.00 %
x dB Bandwidth 101.0 MHz
x dB -26.00 dB
Frequency
Center Freq
27.924960000 GHz
CF Step
20.000000 MHz
Auto Man
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 28.299920000 GHz
Center Freq: 28.299920000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 28.2999 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
95.962 MHz
Total Power 27.4 dBm
Transmit Freq Error -252.46 kHz
% of OBW Power 99.00 %
x dB Bandwidth 101.0 MHz
x dB -26.00 dB
Frequency
Center Freq
28.299920000 GHz
CF Step
20.000000 MHz
Auto Man
Freq Offset
0 Hz

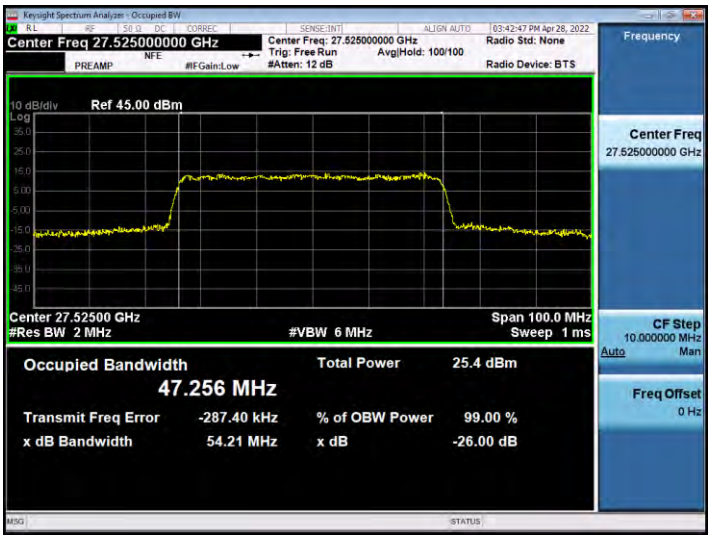
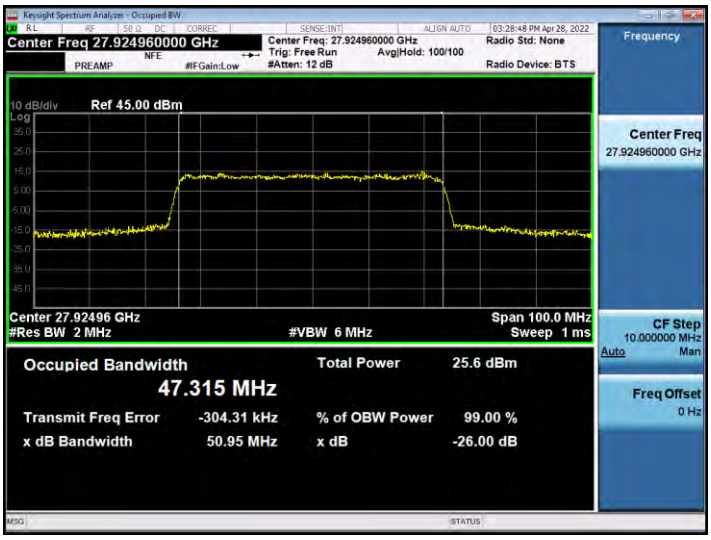
100 MHz, 2CC	
	
	

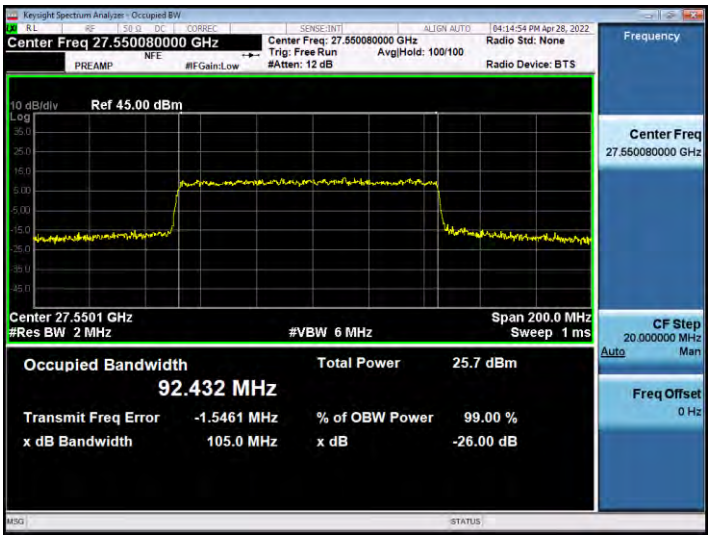
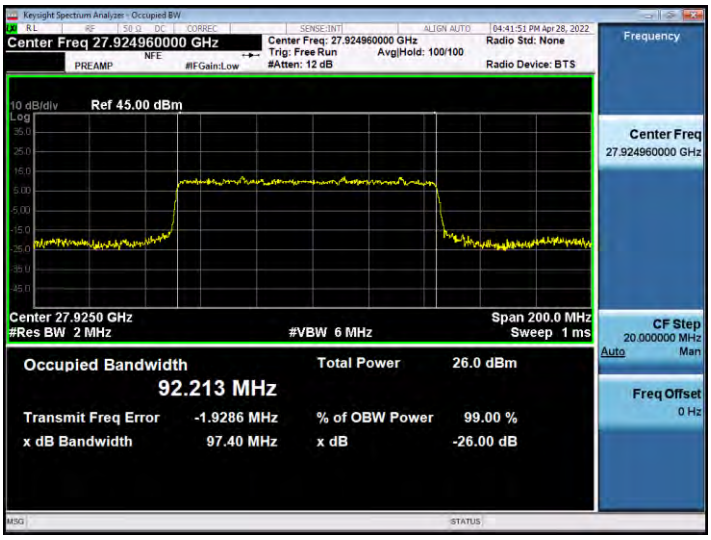
Keysight Spectrum Analyzer - Occupied BW
Center Freq 27.600080000 GHz
Center Freq: 27.600080000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 27.6001 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 400.0 MHz
Sweep 1 ms
Occupied Bandwidth
191.05 MHz
Total Power 27.3 dBm
Transmit Freq Error -2.0418 MHz
% of OBW Power 99.00 %
x dB Bandwidth 197.1 MHz
x dB -26.00 dB
Frequency
Center Freq
27.600080000 GHz
CF Step
40.000000 MHz
Auto Man
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 27.924960000 GHz
Center Freq: 27.924960000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 27.9250 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 400.0 MHz
Sweep 1 ms
Occupied Bandwidth
191.17 MHz
Total Power 26.2 dBm
Transmit Freq Error -2.0870 MHz
% of OBW Power 99.00 %
x dB Bandwidth 197.7 MHz
x dB -26.00 dB
Frequency
Center Freq
27.924960000 GHz
CF Step
40.000000 MHz
Auto Man
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 28.249960000 GHz
Center Freq: 28.249960000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 28.2500 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 400.0 MHz
Sweep 1 ms
Occupied Bandwidth
191.23 MHz
Total Power 26.9 dBm
Transmit Freq Error -1.6623 MHz
% of OBW Power 99.00 %
x dB Bandwidth 198.2 MHz
x dB -26.00 dB
Frequency
Center Freq
28.249960000 GHz
CF Step
40.000000 MHz
Auto Man
Freq Offset
0 Hz

2. L patch: module 1, n261

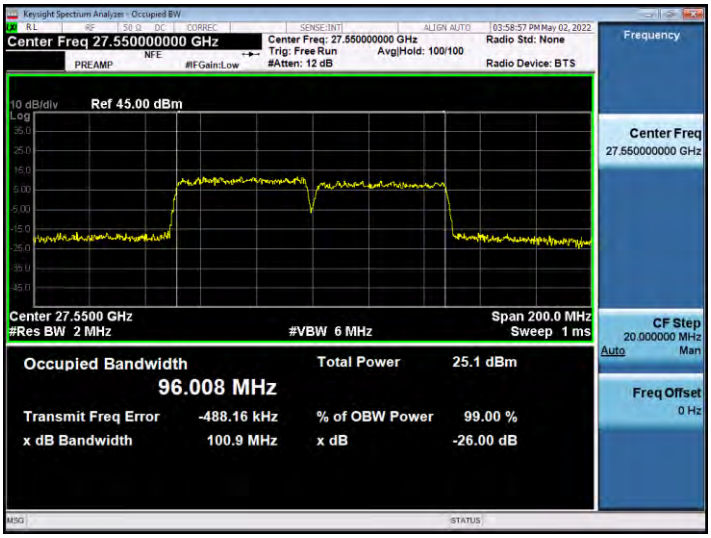
50 MHz, 1CC	
	
	

100 MHz, 1CC	
	
	

Keysight Spectrum Analyzer - Occupied BW
Center Freq 27.550080000 GHz
Center Freq: 27.550080000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
Frequency
10 dB/div
Ref 45.00 dBm
Center Freq
27.550080000 GHz
Center 27.5501 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
CF Step
20.000000 MHz
Auto
Man
Occupied Bandwidth
92.432 MHz
Total Power 25.7 dBm
Transmit Freq Error -1.5461 MHz
% of OBW Power 99.00 %
x dB Bandwidth 105.0 MHz
x dB -26.00 dB
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 27.924960000 GHz
Center Freq: 27.924960000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
Frequency
10 dB/div
Ref 45.00 dBm
Center Freq
27.924960000 GHz
Center 27.9250 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
CF Step
20.000000 MHz
Auto
Man
Occupied Bandwidth
92.213 MHz
Total Power 26.0 dBm
Transmit Freq Error -1.9286 MHz
% of OBW Power 99.00 %
x dB Bandwidth 97.40 MHz
x dB -26.00 dB
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 28.299960000 GHz
Center Freq: 28.299960000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
Frequency
10 dB/div
Ref 45.00 dBm
Center Freq
28.299960000 GHz
Center 28.3000 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
CF Step
20.000000 MHz
Auto
Man
Occupied Bandwidth
92.075 MHz
Total Power 26.4 dBm
Transmit Freq Error -1.9377 MHz
% of OBW Power 99.00 %
x dB Bandwidth 97.26 MHz
x dB -26.00 dB
Freq Offset
0 Hz

50 MHz, 2CC	
	
	

Keysight Spectrum Analyzer - Occupied BW
Center Freq 27.550000000 GHz
Center Freq: 27.550000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 27.5500 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
96.008 MHz
Total Power 25.1 dBm
Transmit Freq Error -488.16 kHz
% of OBW Power 99.00 %
x dB Bandwidth 100.9 MHz
x dB -26.00 dB
Frequency
Center Freq
27.550000000 GHz
CF Step
20.000000 MHz
Auto Man
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 27.924960000 GHz
Center Freq: 27.924960000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 27.9250 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
95.919 MHz
Total Power 25.3 dBm
Transmit Freq Error -729.79 kHz
% of OBW Power 99.00 %
x dB Bandwidth 101.0 MHz
x dB -26.00 dB
Frequency
Center Freq
27.924960000 GHz
CF Step
20.000000 MHz
Auto Man
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 28.299920000 GHz
Center Freq: 28.299920000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 28.2999 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
95.971 MHz
Total Power 25.2 dBm
Transmit Freq Error -271.62 kHz
% of OBW Power 99.00 %
x dB Bandwidth 101.0 MHz
x dB -26.00 dB
Frequency
Center Freq
28.299920000 GHz
CF Step
20.000000 MHz
Auto Man
Freq Offset
0 Hz

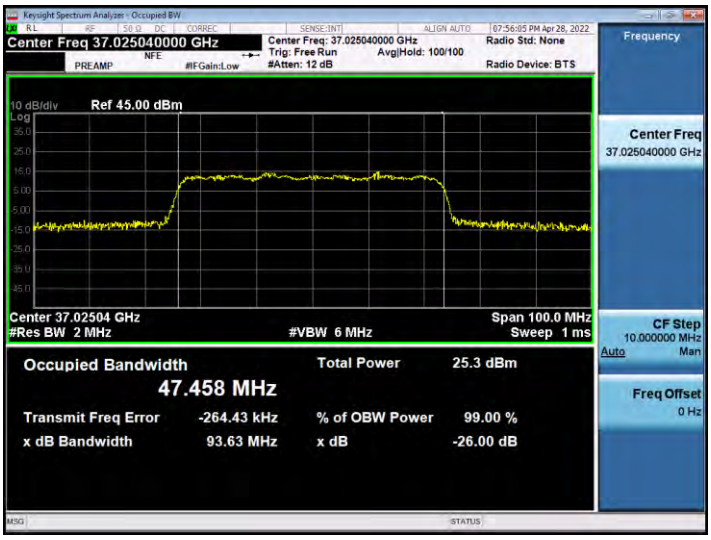
100 MHz, 2CC	
	
	

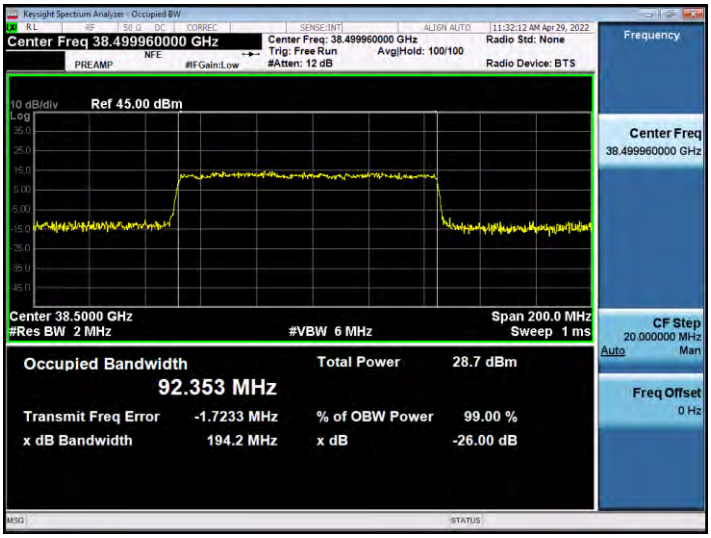
Keysight Spectrum Analyzer - Occupied BW
Center Freq 27.600080000 GHz
Center Freq: 27.600080000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 27.6001 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 400.0 MHz
Sweep 1 ms
Occupied Bandwidth
190.79 MHz
Total Power 25.4 dBm
Transmit Freq Error -2.2544 MHz
% of OBW Power 99.00 %
x dB Bandwidth 196.7 MHz
x dB -26.00 dB
Frequency
Center Freq
27.600080000 GHz
CF Step
40.000000 MHz
Auto Man
Freq Offset
0 Hz

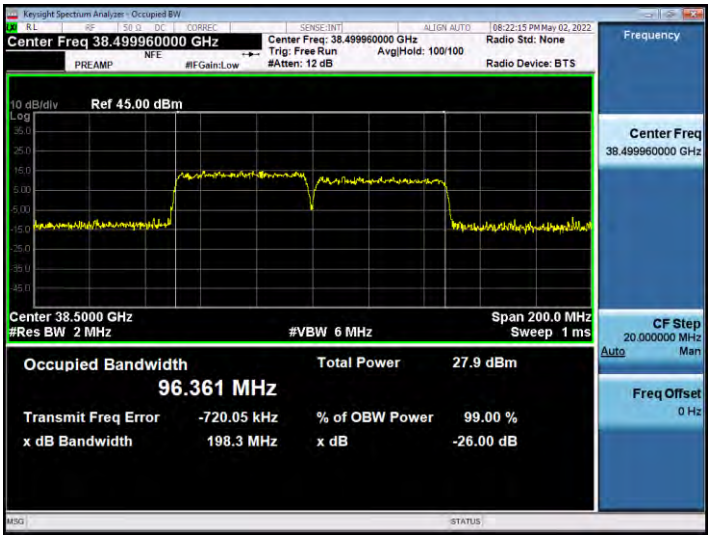
Keysight Spectrum Analyzer - Occupied BW
Center Freq 27.924960000 GHz
Center Freq: 27.924960000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 27.9250 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 400.0 MHz
Sweep 1 ms
Occupied Bandwidth
190.52 MHz
Total Power 25.5 dBm
Transmit Freq Error -2.4282 MHz
% of OBW Power 99.00 %
x dB Bandwidth 196.8 MHz
x dB -26.00 dB
Frequency
Center Freq
27.924960000 GHz
CF Step
40.000000 MHz
Auto Man
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 28.249960000 GHz
Center Freq: 28.249960000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 28.2500 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 400.0 MHz
Sweep 1 ms
Occupied Bandwidth
191.01 MHz
Total Power 24.9 dBm
Transmit Freq Error -1.7054 MHz
% of OBW Power 99.00 %
x dB Bandwidth 248.2 MHz
x dB -26.00 dB
Frequency
Center Freq
28.249960000 GHz
CF Step
40.000000 MHz
Auto Man
Freq Offset
0 Hz

3. K patch: module 0, n260

50 MHz, 1CC	
	
	

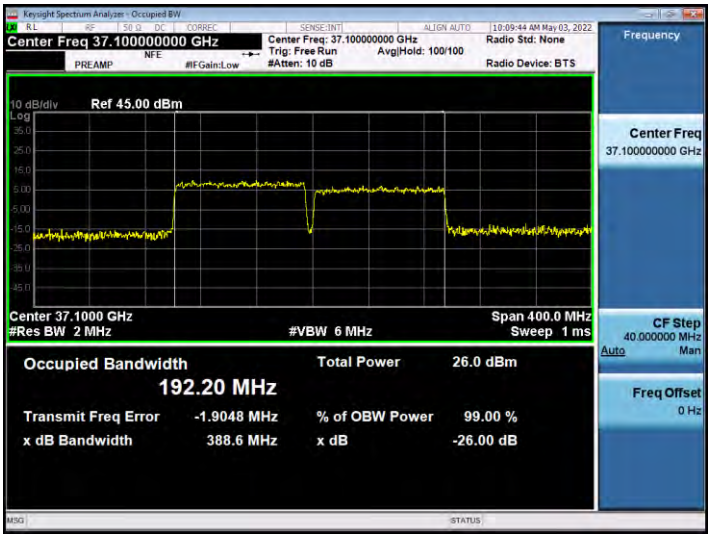
100 MHz, 1CC	
 Keysight Spectrum Analyzer - Occupied BW Center Freq 37.050040000 GHz Center Freq: 37.050040000 GHz Trig: Free Run Avg|Hold: 100/100 #Atten: 12 dB Radio Std: None Radio Device: BTS PREAMP 10 dB/div Ref 45.00 dBm Center 37.0500 GHz #Res BW 2 MHz #VBW 6 MHz Span 200.0 MHz Sweep 1 ms Occupied Bandwidth 93.062 MHz Total Power 27.6 dBm Transmit Freq Error -1.7304 MHz % of OBW Power 99.00 % x dB Bandwidth 191.0 MHz x dB -26.00 dB Frequency Center Freq 37.050040000 GHz CF Step 20.000000 MHz Auto Man Freq Offset 0 Hz	 Keysight Spectrum Analyzer - Occupied BW Center Freq 38.499960000 GHz Center Freq: 38.499960000 GHz Trig: Free Run Avg|Hold: 100/100 #Atten: 12 dB Radio Std: None Radio Device: BTS PREAMP 10 dB/div Ref 45.00 dBm Center 38.5000 GHz #Res BW 2 MHz #VBW 6 MHz Span 200.0 MHz Sweep 1 ms Occupied Bandwidth 92.353 MHz Total Power 28.7 dBm Transmit Freq Error -1.7233 MHz % of OBW Power 99.00 % x dB Bandwidth 194.2 MHz x dB -26.00 dB Frequency Center Freq 38.499960000 GHz CF Step 20.000000 MHz Auto Man Freq Offset 0 Hz
 Keysight Spectrum Analyzer - Occupied BW Center Freq 39.949920000 GHz Center Freq: 39.949920000 GHz Trig: Free Run Avg|Hold: 100/100 #Atten: 12 dB Radio Std: None Radio Device: BTS PREAMP 10 dB/div Ref 45.00 dBm Center 39.9499 GHz #Res BW 2 MHz #VBW 6 MHz Span 200.0 MHz Sweep 1 ms Occupied Bandwidth 92.218 MHz Total Power 30.6 dBm Transmit Freq Error -1.6572 MHz % of OBW Power 99.00 % x dB Bandwidth 148.4 MHz x dB -26.00 dB Frequency Center Freq 39.949920000 GHz CF Step 20.000000 MHz Auto Man Freq Offset 0 Hz	

50 MHz, 2CC	
	
	

Keysight Spectrum Analyzer - Occupied BW
Center Freq 37.050040000 GHz
Center Freq: 37.050040000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 37.0500 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
96.713 MHz
Total Power 26.0 dBm
Transmit Freq Error -426.63 kHz
% of OBW Power 99.00 %
x dB Bandwidth 198.1 MHz
x dB -26.00 dB
Frequency
Center Freq
37.050040000 GHz
CF Step
20.000000 MHz
Auto
Man
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 38.499960000 GHz
Center Freq: 38.499960000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 38.5000 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
96.361 MHz
Total Power 27.9 dBm
Transmit Freq Error -720.05 kHz
% of OBW Power 99.00 %
x dB Bandwidth 198.3 MHz
x dB -26.00 dB
Frequency
Center Freq
38.499960000 GHz
CF Step
20.000000 MHz
Auto
Man
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 39.950000000 GHz
Center Freq: 39.950000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div
Ref 45.00 dBm
Center 39.9500 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
96.713 MHz
Total Power 29.2 dBm
Transmit Freq Error 106.22 kHz
% of OBW Power 99.00 %
x dB Bandwidth 185.9 MHz
x dB -26.00 dB
Frequency
Center Freq
39.950000000 GHz
CF Step
20.000000 MHz
Auto
Man
Freq Offset
0 Hz

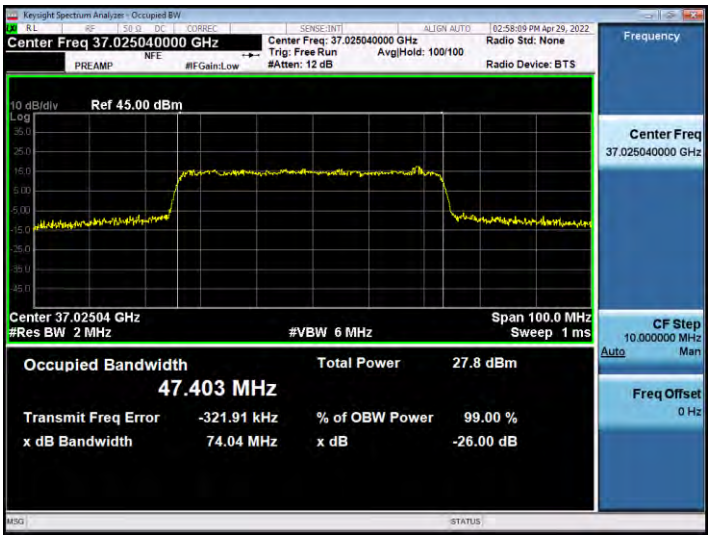
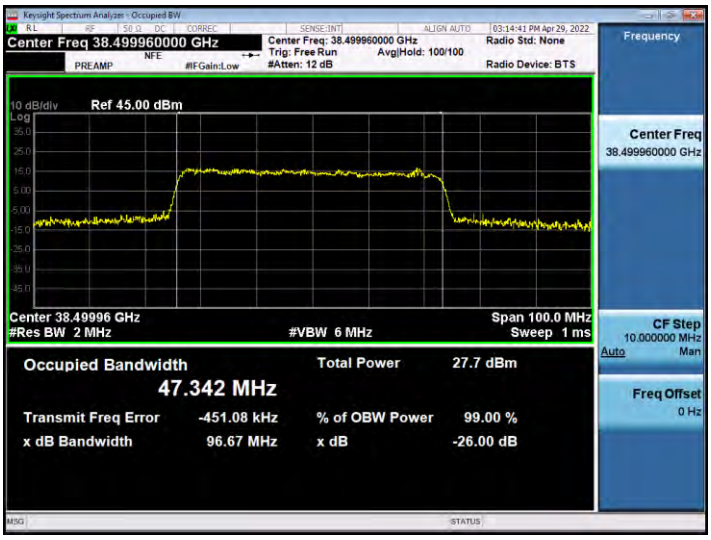
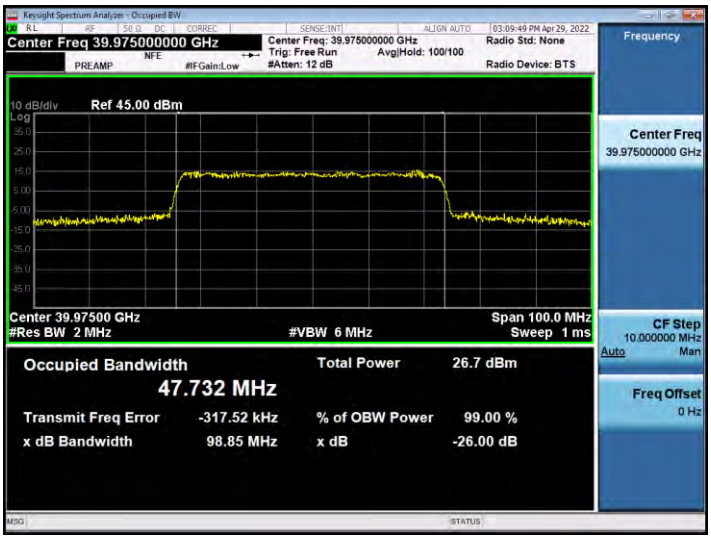
100 MHz, 2CC	
	
	

Keysight Spectrum Analyzer - Occupied BW
Center Freq 37.100000000 GHz
Center Freq: 37.100000000 GHz
Trig: Free Run Avg|Hold: 100/100
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div Ref 45.00 dBm
Center 37.1000 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 400.0 MHz
Sweep 1 ms
Occupied Bandwidth
192.20 MHz
Total Power 26.0 dBm
Transmit Freq Error -1.9048 MHz
% of OBW Power 99.00 %
x dB Bandwidth 388.6 MHz
x dB -26.00 dB
Frequency
Center Freq
37.100000000 GHz
CF Step
40.000000 MHz
Auto Man
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 38.499960000 GHz
Center Freq: 38.499960000 GHz
Trig: Free Run Avg|Hold: 100/100
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div Ref 45.00 dBm
Center 38.5000 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 400.0 MHz
Sweep 1 ms
Occupied Bandwidth
191.49 MHz
Total Power 27.2 dBm
Transmit Freq Error -1.9767 MHz
% of OBW Power 99.00 %
x dB Bandwidth 370.1 MHz
x dB -26.00 dB
Frequency
Center Freq
38.499960000 GHz
CF Step
40.000000 MHz
Auto Man
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 39.899920000 GHz
Center Freq: 39.899920000 GHz
Trig: Free Run Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div Ref 45.00 dBm
Center 39.8999 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 400.0 MHz
Sweep 1 ms
Occupied Bandwidth
192.41 MHz
Total Power 29.1 dBm
Transmit Freq Error -1.2116 MHz
% of OBW Power 99.00 %
x dB Bandwidth 400.0 MHz
x dB -26.00 dB
Frequency
Center Freq
39.899920000 GHz
CF Step
40.000000 MHz
Auto Man
Freq Offset
0 Hz

4. L patch: module 1, n260

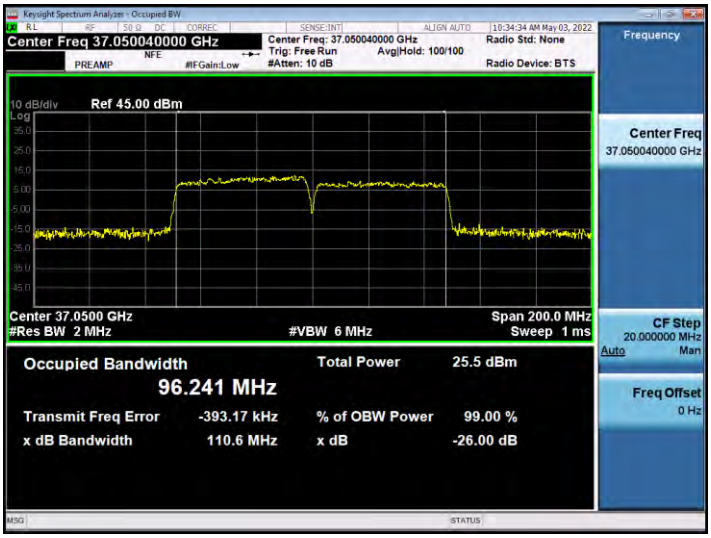
50 MHz, 1CC	
	
	

100 MHz, 1CC	
	
	

Keysight Spectrum Analyzer - Occupied BW
Center Freq 37.050040000 GHz
Center Freq: 37.050040000 GHz
Trig: Free Run Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div Ref 45.00 dBm
Center 37.0500 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
92.554 MHz
Total Power 26.6 dBm
Transmit Freq Error -1.7947 MHz
% of OBW Power 99.00 %
x dB Bandwidth 186.7 MHz
x dB -26.00 dB
Frequency
Center Freq
37.050040000 GHz
CF Step
20.000000 MHz
Auto Man
Freq Offset
0 Hz

Keysight Spectrum Analyzer - Occupied BW
Center Freq 38.499960000 GHz
Center Freq: 38.499960000 GHz
Trig: Free Run Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div Ref 45.00 dBm
Center 38.5000 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
92.639 MHz
Total Power 27.4 dBm
Transmit Freq Error -1.6456 MHz
% of OBW Power 99.00 %
x dB Bandwidth 192.3 MHz
x dB -26.00 dB
Frequency
Center Freq
38.499960000 GHz
CF Step
20.000000 MHz
Auto Man
Freq Offset
0 Hz

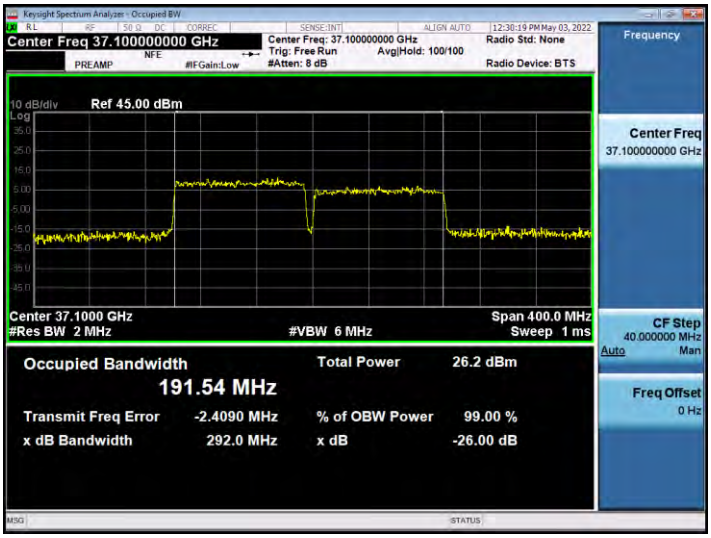
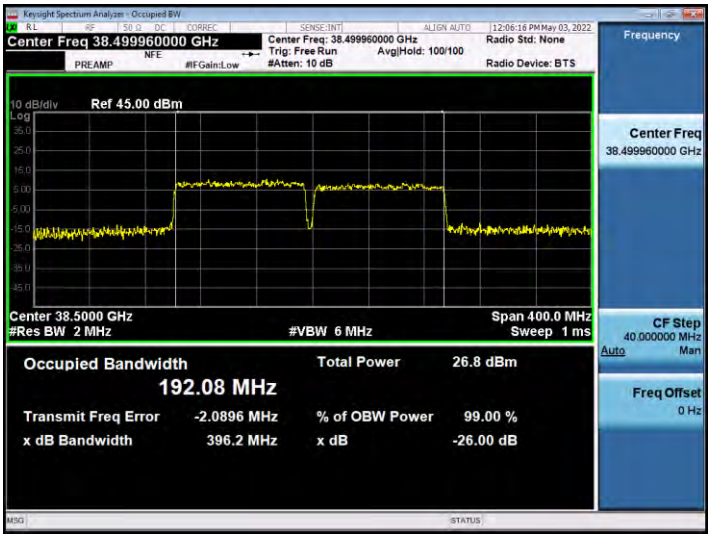
Keysight Spectrum Analyzer - Occupied BW
Center Freq 39.949920000 GHz
Center Freq: 39.949920000 GHz
Trig: Free Run Avg|Hold: 100/100
#Atten: 12 dB
Radio Std: None
Radio Device: BTS
PREAMP
#IFGain:Low
10 dB/div Ref 45.00 dBm
Center 39.9499 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
Occupied Bandwidth
93.583 MHz
Total Power 26.7 dBm
Transmit Freq Error -1.6123 MHz
% of OBW Power 99.00 %
x dB Bandwidth 199.6 MHz
x dB -26.00 dB
Frequency
Center Freq
39.949920000 GHz
CF Step
20.000000 MHz
Auto Man
Freq Offset
0 Hz

50 MHz, 2CC	
	
	

Keysight Spectrum Analyzer - Occupied BW
Center Freq 37.050040000 GHz
Center Freq: 37.050040000 GHz
Trig: Free Run Avg|Hold: 100/100
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div Ref 45.00 dBm
Center Freq 37.050040000 GHz
Center 37.0500 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
CF Step 20.000000 MHz
Auto Man
Freq Offset 0 Hz
Occupied Bandwidth
96.241 MHz
Total Power 25.5 dBm
Transmit Freq Error -393.17 kHz
% of OBW Power 99.00 %
x dB Bandwidth 110.6 MHz
x dB -26.00 dB

Keysight Spectrum Analyzer - Occupied BW
Center Freq 38.499960000 GHz
Center Freq: 38.499960000 GHz
Trig: Free Run Avg|Hold: 100/100
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div Ref 45.00 dBm
Center Freq 38.499960000 GHz
Center 38.5000 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
CF Step 20.000000 MHz
Auto Man
Freq Offset 0 Hz
Occupied Bandwidth
96.510 MHz
Total Power 26.8 dBm
Transmit Freq Error -679.49 kHz
% of OBW Power 99.00 %
x dB Bandwidth 181.8 MHz
x dB -26.00 dB

Keysight Spectrum Analyzer - Occupied BW
Center Freq 39.950000000 GHz
Center Freq: 39.950000000 GHz
Trig: Free Run Avg|Hold: 100/100
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
Frequency
10 dB/div Ref 45.00 dBm
Center Freq 39.950000000 GHz
Center 39.9500 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 200.0 MHz
Sweep 1 ms
CF Step 20.000000 MHz
Auto Man
Freq Offset 0 Hz
Occupied Bandwidth
97.498 MHz
Total Power 23.9 dBm
Transmit Freq Error 16.040 kHz
% of OBW Power 99.00 %
x dB Bandwidth 199.9 MHz
x dB -26.00 dB

100 MHz, 2CC	
	
	

Keysight Spectrum Analyzer - Occupied BW
Center Freq 37.100000000 GHz
Center Freq: 37.100000000 GHz
Trig: Free Run Avg|Hold: 100/100
#Atten: 8 dB
Radio Std: None
Radio Device: BTS
12:30:19 PM May 03, 2022
PREAMP
#IFGain:Low
10 dB/div Ref 45.00 dBm
Center 37.1000 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 400.0 MHz
Sweep 1 ms
Occupied Bandwidth
191.54 MHz
Total Power 26.2 dBm
Transmit Freq Error -2.4090 MHz
% of OBW Power 99.00 %
x dB Bandwidth 292.0 MHz
x dB -26.00 dB
Frequency
Center Freq
37.100000000 GHz
CF Step
40.000000 MHz
Auto Man
Freq Offset
0 Hz
MSG
STATUS

Keysight Spectrum Analyzer - Occupied BW
Center Freq 38.499960000 GHz
Center Freq: 38.499960000 GHz
Trig: Free Run Avg|Hold: 100/100
#Atten: 10 dB
Radio Std: None
Radio Device: BTS
12:06:16 PM May 03, 2022
PREAMP
#IFGain:Low
10 dB/div Ref 45.00 dBm
Center 38.5000 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 400.0 MHz
Sweep 1 ms
Occupied Bandwidth
192.08 MHz
Total Power 26.8 dBm
Transmit Freq Error -2.0896 MHz
% of OBW Power 99.00 %
x dB Bandwidth 396.2 MHz
x dB -26.00 dB
Frequency
Center Freq
38.499960000 GHz
CF Step
40.000000 MHz
Auto Man
Freq Offset
0 Hz
MSG
STATUS

Keysight Spectrum Analyzer - Occupied BW
Center Freq 39.899920000 GHz
Center Freq: 39.899920000 GHz
Trig: Free Run Avg|Hold: 100/100
#Atten: 8 dB
Radio Std: None
Radio Device: BTS
12:44:42 PM May 03, 2022
PREAMP
#IFGain:Low
10 dB/div Ref 45.00 dBm
Center 39.8999 GHz
#Res BW 2 MHz
#VBW 6 MHz
Span 400.0 MHz
Sweep 1 ms
Occupied Bandwidth
193.13 MHz
Total Power 24.5 dBm
Transmit Freq Error -1.0049 MHz
% of OBW Power 99.00 %
x dB Bandwidth 399.8 MHz
x dB -26.00 dB
Frequency
Center Freq
39.899920000 GHz
CF Step
40.000000 MHz
Auto Man
Freq Offset
0 Hz
MSG
STATUS

5.2. EQUIVALENT ISOTROPIC RADIATED POWER

Test Overview

Equivalent Isotropic Radiated Power (EIRP) measurements are performed using broadband horn antennas. All measurements are performed as RMS average measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

The average power of the sum of all antenna elements is limited to a maximum EIRP of +43 dBm.

FCC Rules

Test Requirements:

§ 30.202 Power limits.

(b) For mobile stations, the average power of the sum of all antenna elements is limited to a maximum EIRP of +43 dBm.

Test Procedures:

The measurement is performed in accordance with Section 5.2.4.4.2 of ANSI C63.26.

a) Set span to 2 × to 3 × the OBW.

b) Set RBW = 1% to 5% of the OBW.

c) Set VBW ≥ 3 × RBW.

d) Set number of measurement points in sweep ≥ 2 × span / RBW.

e) Sweep time:

1) Set = auto-couple, or

2) Set ≥ [10 × (number of points in sweep) × (transmission symbol period)] for single sweep (automation-compatible) measurement.

f) Detector = power averaging (rms).

g) Set sweep trigger to “free run.”

h) Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.

i) Compute power by integrating the spectrum across the OBW of the signal using the instrument’s band or channel power measurement function with band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

j) Add 10 log (1/duty cycle) to the measured power level to compute the average power during continuous transmission.

Note:

1. The EUT was tested under rotating conditions and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
2. Elements within the same antenna array are correlated to produce beamforming array gain. Antenna arrays cannot be correlated with another antenna array. During testing, only one antenna array was active.
3. Radiated power levels are investigated while the receive antenna was rotated through all angles to determine the worst case polarization/positioning. It was determined that H=0 degree and V=90 degree are the worst case positions when the EUT was transmitting horizontally and vertically polarized beams, respectively.

Test Results:

K patch: module 0, n261

SISO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	RB Size/Offset	EIRP [dBm]
1	50 MHz	27525.00	Low	H	BPSK	H	10/11	26.20
		27924.96	Mid	H	QPSK	H	10/11	24.96
		28324.92	High	H	QPSK	H	10/11	26.14
		27525.00	Low	H	QPSK	H	10/11	26.13
		27525.00	Low	H	16QAM	H	10/11	24.13
		27525.00	Low	H	64QAM	H	1/16	22.04
	100 MHz	27550.08	Low	H	QPSK	H	20/22	26.22
		27924.96	Mid	H	QPSK	H	20/22	25.02
		28299.96	High	H	QPSK	H	20/22	25.93
		27550.08	Low	H	BPSK	H	20/22	26.19
		27550.08	Low	H	16QAM	H	20/22	23.97
		27550.08	Low	H	64QAM	H	1/32	21.71
2	50 MHz	27525.00	Low	H	BPSK	H	32/0	22.82
		27900.00	Mid	H	BPSK	H	32/0	22.20
		28274.88	High	H	BPSK	H	32/0	22.51
		27525.00	Low	H	QPSK	H	32/0	22.78
		27525.00	Low	H	16QAM	H	10/11	21.05
		27525.00	Low	H	64QAM	H	32/0	19.04
	100 MHz	27550.08	Low	H	QPSK	H	64/0	22.49
		27874.92	Mid	H	QPSK	H	64/0	20.21
		28200.00	High	H	QPSK	H	64/0	22.06
		27550.08	Low	H	BPSK	H	64/0	22.48
		27550.08	Low	H	16QAM	H	64/0	21.08
		27550.08	Low	H	64QAM	H	20/22	18.88

SISO Dual

CCs active	BW	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	RB Size/Offset	EIRP [dBm]
1	50 MHz	27525.00	Low	H+V	BPSK	H	1/11	26.89
		27924.96	Mid	H+V	BPSK	V	10/11	25.55
		28324.92	High	H+V	BPSK	H	1/11	26.60
		27525.00	Low	H+V	QPSK	H	1/11	25.83
		27525.00	Low	H+V	16QAM	H	1/11	23.82
		27525.00	Low	H+V	64QAM	H	1/11	21.76
	100 MHz	27550.08	Low	H+V	QPSK	H	1/33	27.24
		27924.96	Mid	H+V	QPSK	V	1/33	25.57
		28299.96	High	H+V	QPSK	H	1/33	26.99
		27550.08	Low	H+V	BPSK	H	1/33	26.87
		27550.08	Low	H+V	16QAM	H	1/33	25.02
		27550.08	Low	H+V	64QAM	H	1/33	22.87
2	50 MHz	27525.00	Low	H+V	QPSK	H	32/0	22.96
		27900.00	Mid	H+V	QPSK	V	32/0	22.43
		28274.88	High	H+V	QPSK	H	32/0	22.73
		27525.00	Low	H+V	BPSK	H	10/11	21.86
		27525.00	Low	H+V	16QAM	H	32/0	21.28
		27525.00	Low	H+V	64QAM	H	32/0	19.06
	100 MHz	27550.08	Low	H+V	BPSK	H	64/0	22.82
		27874.92	Mid	H+V	BPSK	V	20/22	20.42
		28200.00	High	H+V	BPSK	H	64/0	22.36
		27550.08	Low	H+V	QPSK	H	64/0	22.58
		27550.08	Low	H+V	16QAM	H	64/0	21.21
		27550.08	Low	H+V	64QAM	H	64/0	19.11

L patch: module 1, n261

SISO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	RB Size/Offset	EIRP [dBm]
1	50 MHz	27525.00	Low	H	BPSK	H	10/11	26.09
		27924.96	Mid	H	BPSK	H	1/16	23.47
		28324.92	High	H	BPSK	H	10/11	25.43
		27525.00	Low	H	QPSK	H	10/11	25.94
		27525.00	Low	H	16QAM	H	10/11	23.83
		27525.00	Low	H	64QAM	H	10/11	21.55
	100 MHz	27550.08	Low	H	BPSK	H	20/22	25.85
		27924.96	Mid	H	BPSK	H	20/22	24.18
		28299.96	High	H	BPSK	H	20/22	25.30
		27550.08	Low	H	QPSK	H	20/22	25.83
		27550.08	Low	H	16QAM	H	20/22	23.65
		27550.08	Low	H	64QAM	H	1/33	21.80
2	50 MHz	27525.00	Low	H	BPSK	H	32/0	22.24
		27900	Mid	H	BPSK	H	32/0	20.85
		28274.88	High	H	BPSK	H	32/0	21.96
		27525.00	Low	H	QPSK	H	32/0	22.25
		27525.00	Low	H	16QAM	H	32/0	20.59
		27525.00	Low	H	64QAM	H	32/0	18.46
	100 MHz	27550.08	Low	H	QPSK	H	64/0	22.14
		27874.92	Mid	H	QPSK	H	64/0	20.77
		28200.00	High	H	QPSK	H	64/0	21.54
		27550.08	Low	H	BPSK	H	64/0	22.12
		27550.08	Low	H	16QAM	H	64/0	20.55
		27550.08	Low	H	64QAM	H	64/0	18.66

SISO Dual

CCs active	BW	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	RB Size/Offset	EIRP [dBm]
1	50 MHz	27525.00	Low	H+V	QPSK	H	1/16	22.95
		27924.96	Mid	H+V	QPSK	H	10/11	23.40
		28324.92	High	H+V	QPSK	H	10/11	23.73
		28324.92	High	H+V	BPSK	H	10/11	23.69
		28324.92	High	H+V	16QAM	H	10/11	21.80
		28324.92	High	H+V	64QAM	H	10/11	19.63
	100 MHz	27550.08	Low	H+V	BPSK	H	1/33	23.16
		27924.96	Mid	H+V	BPSK	H	1/33	23.17
		28299.96	High	H+V	BPSK	H	1/22	23.84
		28299.96	High	H+V	QPSK	H	1/22	23.82
		28299.96	High	H+V	16QAM	H	1/22	21.80
		28299.96	High	H+V	64QAM	H	1/22	20.24
2	50 MHz	27525.00	Low	H+V	QPSK	H	16/16	20.38
		27900.00	Mid	H+V	QPSK	H	32/0	20.49
		28274.88	High	H+V	QPSK	H	16/16	20.31
		27900.00	Mid	H+V	BPSK	H	32/0	20.25
		27900.00	Mid	H+V	16QAM	H	32/0	18.85
		27900.00	Mid	H+V	64QAM	H	32/0	16.74
	100 MHz	27550.08	Low	H+V	QPSK	H	32/32	20.28
		27874.92	Mid	H+V	QPSK	H	64/0	20.78
		28200.00	High	H+V	QPSK	H	64/0	20.09
		27874.92	Mid	H+V	BPSK	H	64/0	20.76
		27874.92	Mid	H+V	16QAM	H	64/0	19.21
		27874.92	Mid	H+V	64QAM	H	64/0	17.18

K patch: module 0, n260

SISO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	RB Size/Offset	EIRP [dBm]
1	50 MHz	37025.04	Low	V	BPSK	H	1/16	25.30
		38499.96	Mid	V	BPSK	H	10/11	26.46
		39975.00	High	H	BPSK	V	10/11	26.81
		39975.00	High	H	QPSK	V	10/11	26.82
		39975.00	High	H	16QAM	V	10/11	24.90
		39975.00	High	H	64QAM	V	10/11	22.51
	100 MHz	37050.00	Low	H	QPSK	V	1/33	24.30
		38499.96	Mid	V	QPSK	H	20/22	26.13
		39949.92	High	H	QPSK	V	1/33	26.92
		39949.92	High	H	BPSK	V	1/33	26.65
		39949.92	High	H	16QAM	V	1/33	25.05
		39949.92	High	H	64QAM	V	1/33	22.00
2	50 MHz	37025.04	Low	H	QPSK	V	32/0	20.46
		38474.88	Mid	H	QPSK	V	32/0	21.43
		39924.96	High	H	QPSK	V	32/0	23.46
		39924.96	High	H	BPSK	V	32/0	23.53
		39924.96	High	H	16QAM	V	32/0	21.70
		39924.96	High	H	64QAM	V	32/0	19.81
	100 MHz	37050.00	Low	H	QPSK	V	64/0	21.46
		38449.92	Mid	V	QPSK	H	64/0	23.10
		39849.96	High	H	QPSK	V	64/0	23.25
		39849.96	High	H	BPSK	V	64/0	23.31
		39849.96	High	H	16QAM	V	64/0	21.31
		39849.96	High	H	64QAM	V	64/0	19.32

SISO Dual

CCs active	BW	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	RB Size/Offset	EIRP [dBm]
1	50 MHz	37025.04	Low	H+V	QPSK	H	10/11	25.54
		38499.96	Mid	H+V	QPSK	V	10/11	26.55
		39975.00	High	H+V	QPSK	V	1/16	28.45
		39975.00	High	H+V	BPSK	H	1/16	28.20
		39975.00	High	H+V	16QAM	H	1/16	26.51
		39975.00	High	H+V	64QAM	H	1/16	24.79
	100 MHz	37050.00	Low	H+V	BPSK	H	1/22	24.86
		38499.96	Mid	H+V	BPSK	V	1/22	26.23
		39949.92	High	H+V	BPSK	V	20/22	28.23
		39949.92	High	H+V	QPSK	V	20/22	28.06
		39949.92	High	H+V	16QAM	V	20/22	26.21
		39949.92	High	H+V	64QAM	V	20/22	24.02
2	50 MHz	37025.04	Low	H+V	QPSK	H	32/0	21.46
		38474.88	Mid	H+V	QPSK	V	32/0	23.38
		39924.96	High	H+V	QPSK	V	32/0	24.78
		39924.96	High	H+V	BPSK	V	32/0	24.31
		39924.96	High	H+V	16QAM	V	32/0	23.21
		39924.96	High	H+V	64QAM	V	32/0	20.97
	100 MHz	37050.00	Low	H+V	BPSK	V	64/0	21.52
		38449.92	Mid	H+V	BPSK	H	64/0	22.83
		39849.96	High	H+V	BPSK	V	64/0	24.62
		39849.96	High	H+V	QPSK	V	64/0	24.38
		39849.96	High	H+V	16QAM	V	64/0	23.04
		39849.96	High	H+V	64QAM	V	64/0	20.83

L patch: module 1, n260

SISO

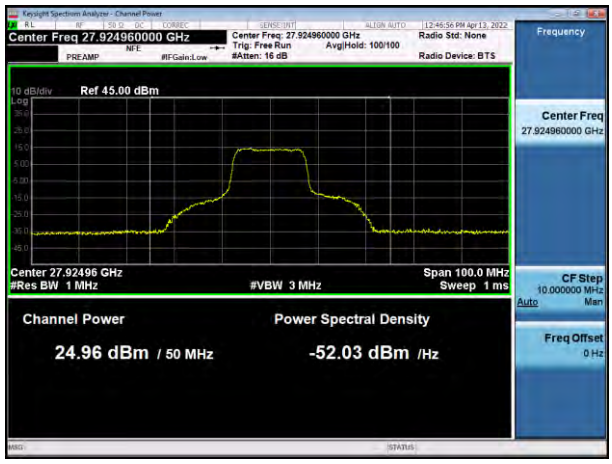
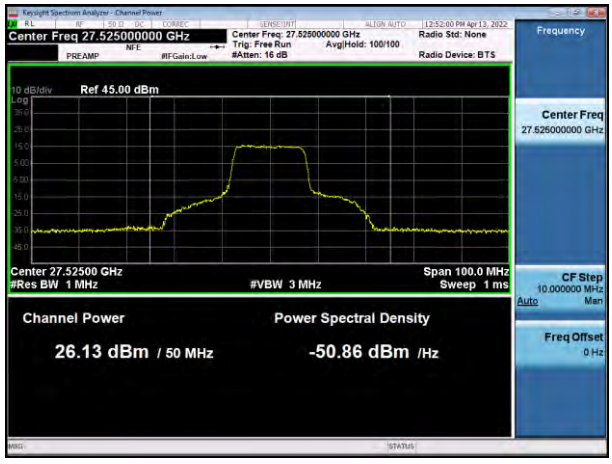
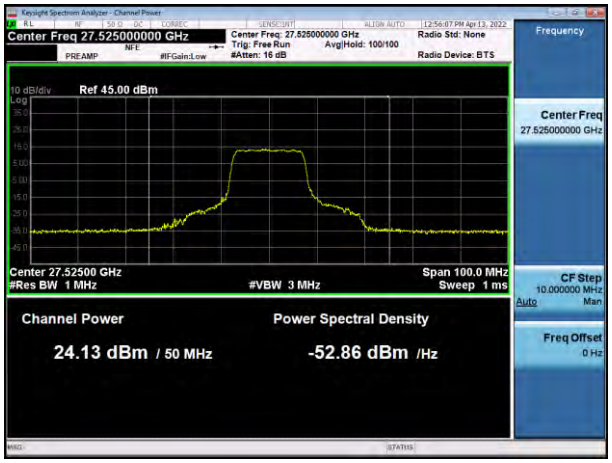
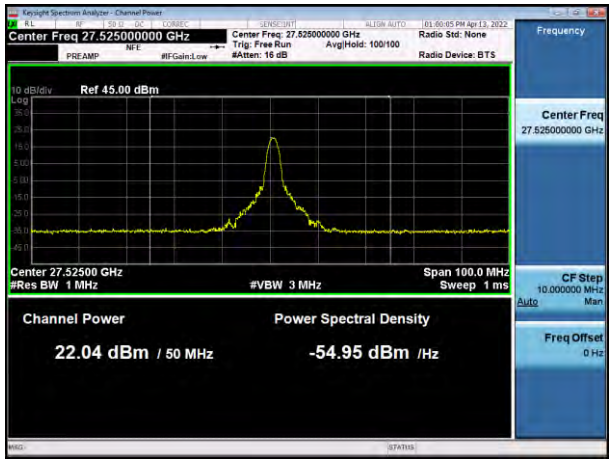
CCs active	BW	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	RB Size/Offset	EIRP [dBm]
1	50 MHz	37025.04	Low	H	BPSK	V	1/11	24.27
		38499.96	Mid	H	BPSK	V	1/11	24.13
		39975.00	High	H	QPSK	V	1/16	23.74
		37025.04	Low	H	QPSK	V	1/16	24.44
		37025.04	Low	H	16QAM	V	1/16	22.64
		37025.04	Low	H	64QAM	V	1/16	19.32
	100 MHz	37050.00	Low	H	QPSK	V	1/22	24.32
		38499.96	Mid	H	QPSK	V	1/22	26.02
		39949.92	High	H	QPSK	V	20/22	23.90
		38499.96	Mid	H	BPSK	V	1/22	25.29
		38499.96	Mid	H	16QAM	V	1/22	23.60
		38499.96	Mid	H	64QAM	V	1/22	21.93
2	50 MHz	37025.04	Low	H	BPSK	V	32/0	20.24
		38474.88	Mid	H	BPSK	V	32/0	20.58
		39924.96	High	H	BPSK	V	32/0	20.34
		38474.88	Mid	H	QPSK	V	32/0	20.59
		38474.88	Mid	H	16QAM	V	32/0	18.87
		38474.88	Mid	H	64QAM	V	32/0	16.69
	100 MHz	37050.00	Low	H	QPSK	V	64/0	21.03
		38449.92	Mid	H	QPSK	V	64/0	22.08
		39849.96	High	H	QPSK	V	64/0	20.10
		38449.92	Mid	H	BPSK	V	64/0	22.23
		38449.92	Mid	H	16QAM	V	64/0	20.55
		38449.92	Mid	H	64QAM	V	64/0	18.58

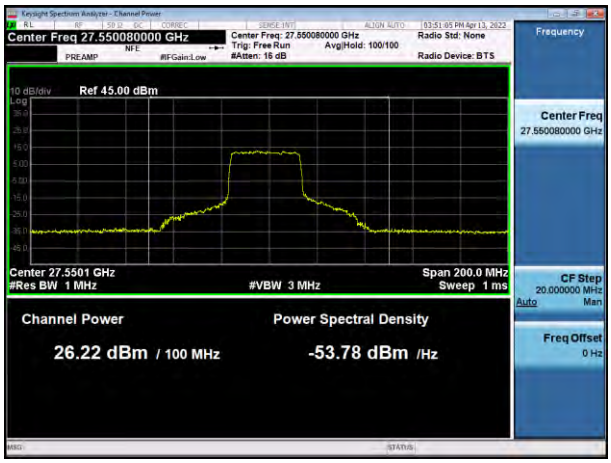
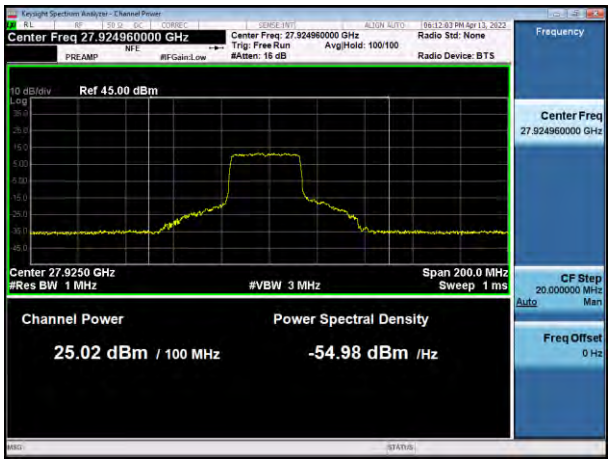
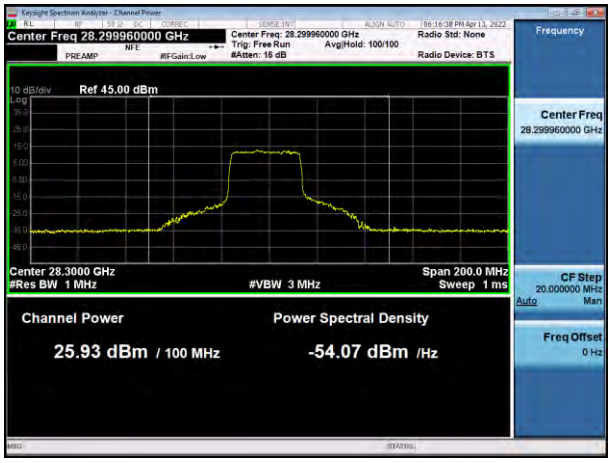
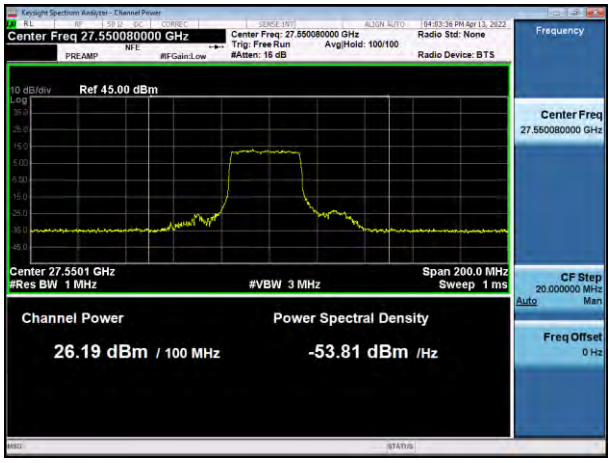
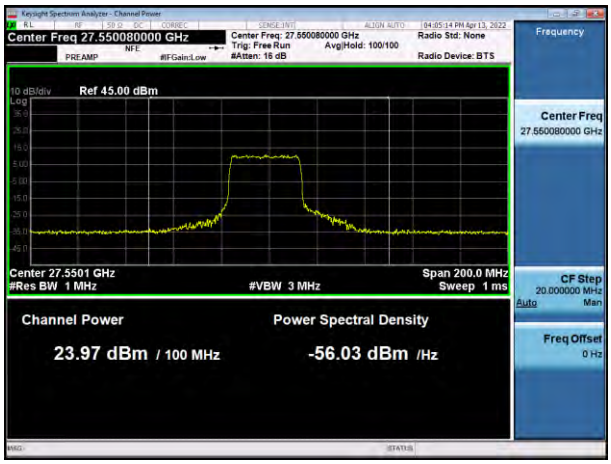
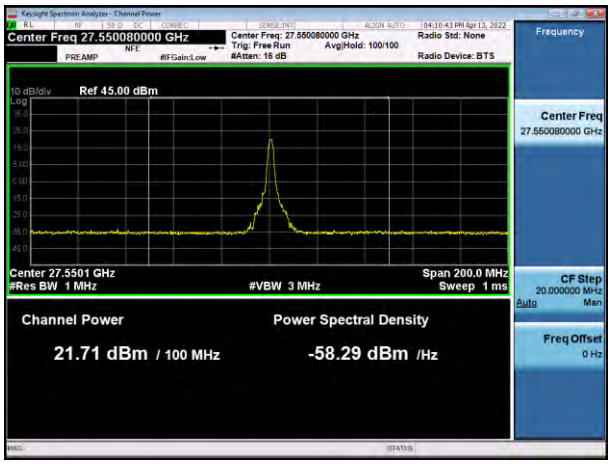
SISO Dual

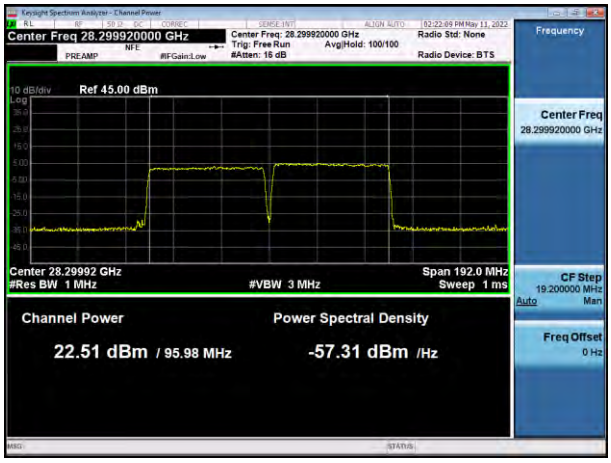
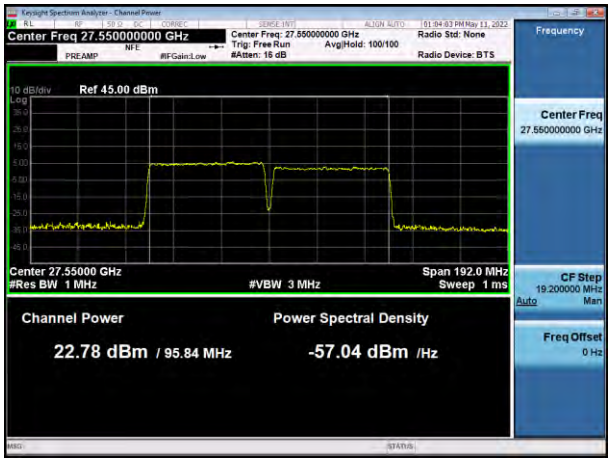
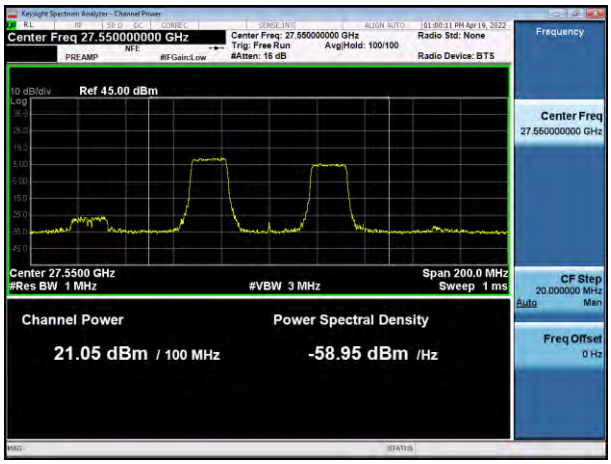
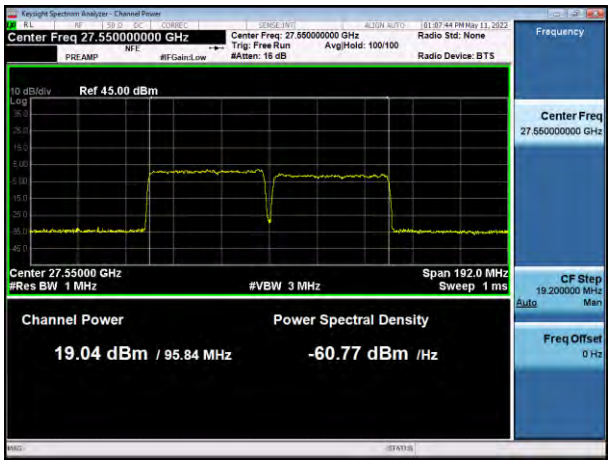
CCs active	BW	Frequency [MHz]	Channel	Beam Pol.	Modulation	Ant. Pol. [H/V]	RB Size/Offset	EIRP [dBm]
1	50 MHz	37025.04	Low	H+V	QPSK	V	1/16	25.40
		38499.96	Mid	H+V	QPSK	H	1/11	25.42
		39975.00	High	H+V	QPSK	H	1/11	25.22
		38499.96	Mid	H+V	BPSK	H	1/11	25.05
		38499.96	Mid	H+V	16QAM	H	1/11	23.79
		38499.96	Mid	H+V	64QAM	H	1/11	22.69
	100 MHz	37050.00	Low	H+V	QPSK	V	1/22	25.61
		38499.96	Mid	H+V	QPSK	H	20/22	25.22
		39949.92	High	H+V	QPSK	V	20/22	24.44
		37050.00	Low	H+V	BPSK	V	1/22	25.17
		37050.00	Low	H+V	16QAM	V	20/22	23.09
		37050.00	Low	H+V	64QAM	V	1/22	21.34
2	50 MHz	37025.04	Low	H+V	BPSK	V	32/0	21.12
		38474.88	Mid	H+V	BPSK	H	32/0	22.45
		39924.96	High	H+V	BPSK	V	32/0	19.60
		38474.88	Mid	H+V	QPSK	H	32/0	22.18
		38474.88	Mid	H+V	16QAM	H	32/0	20.84
		38474.88	Mid	H+V	64QAM	H	32/0	18.14
	100 MHz	37050.00	Low	H+V	BPSK	V	64/0	21.74
		38449.92	Mid	H+V	BPSK	H	64/0	22.25
		39849.96	High	H+V	BPSK	V	64/0	19.77
		38449.92	Mid	H+V	QPSK	H	64/0	22.01
		38449.92	Mid	H+V	16QAM	H	64/0	20.40
		38449.92	Mid	H+V	64QAM	H	64/0	17.61

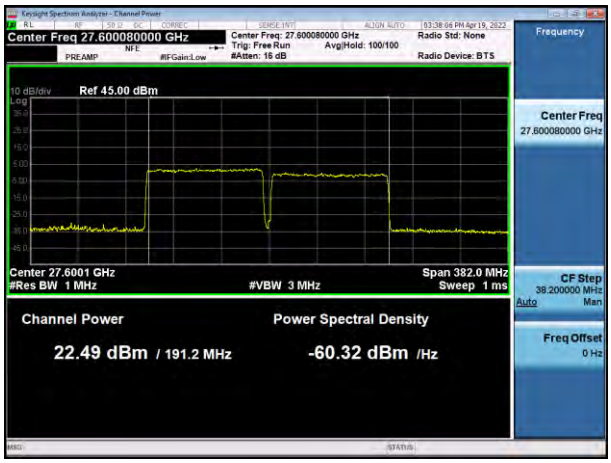
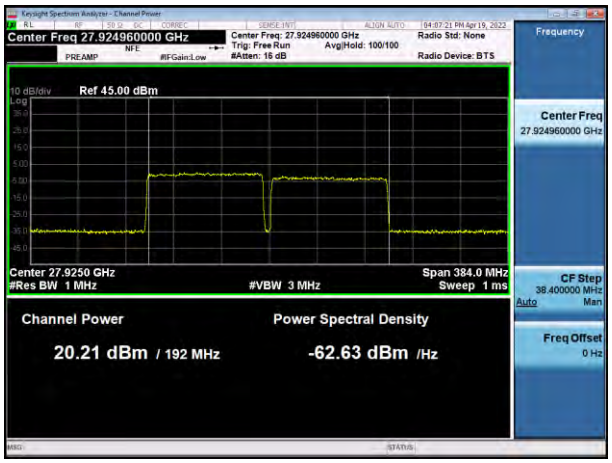
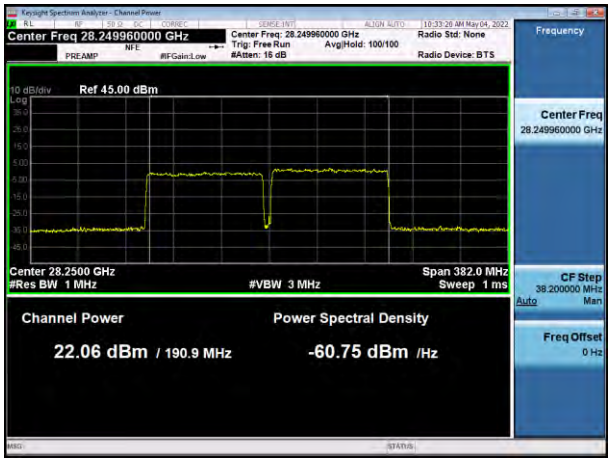
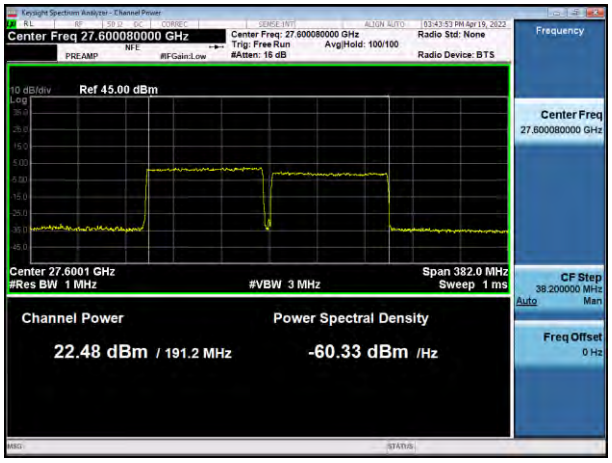
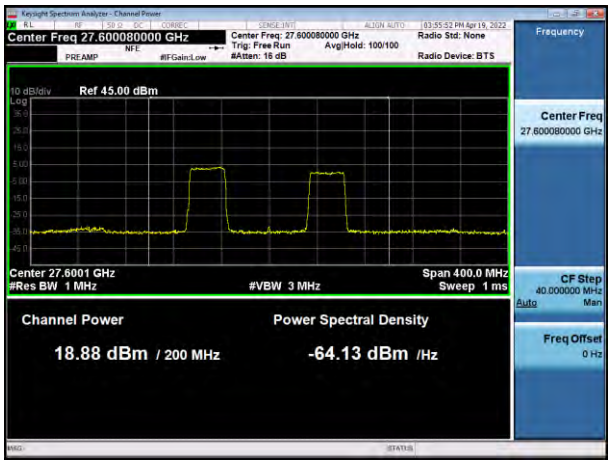
Plot Data of EIRP

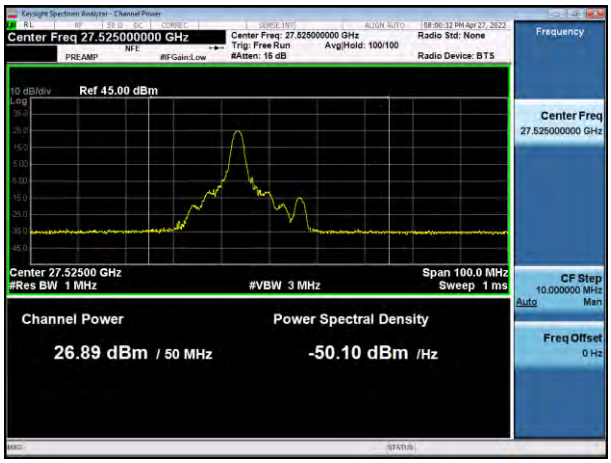
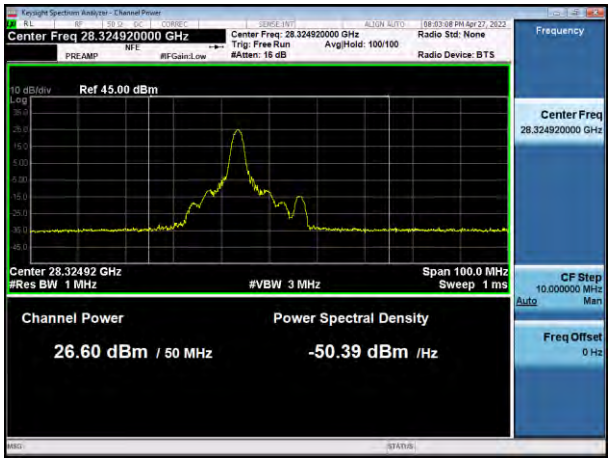
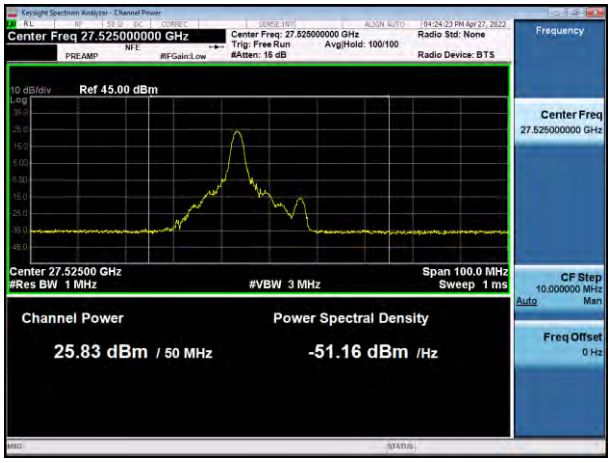
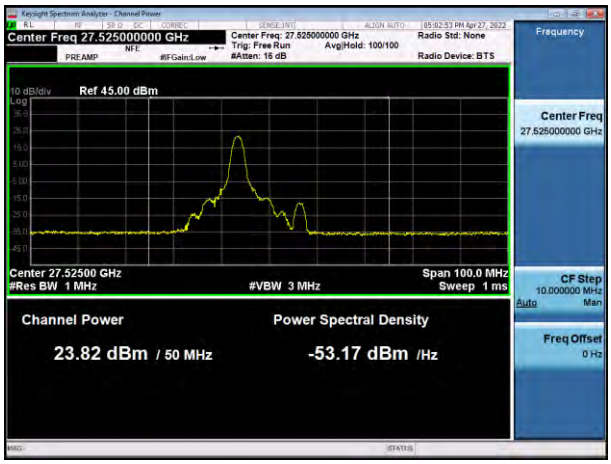
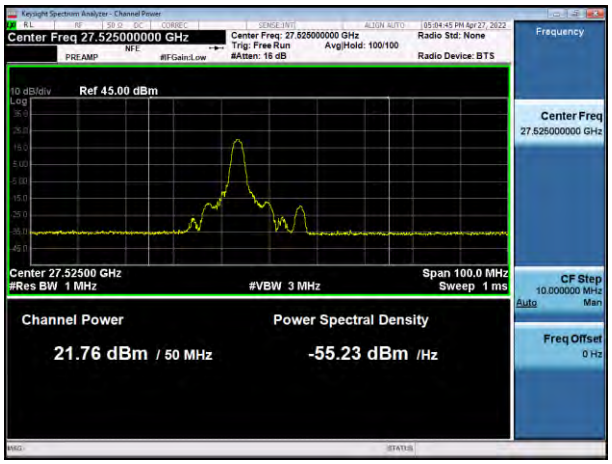
1. **K patch: module 0, n261**

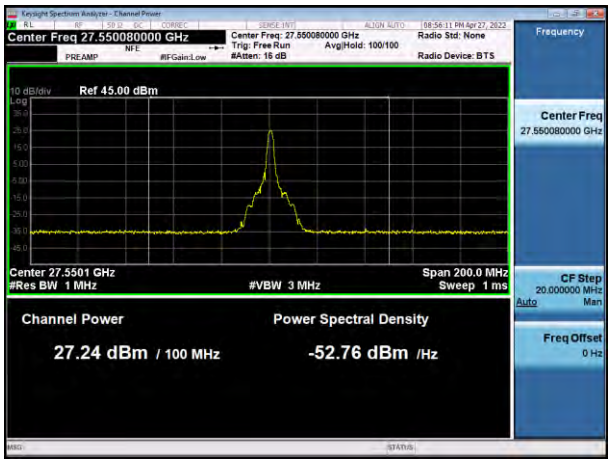
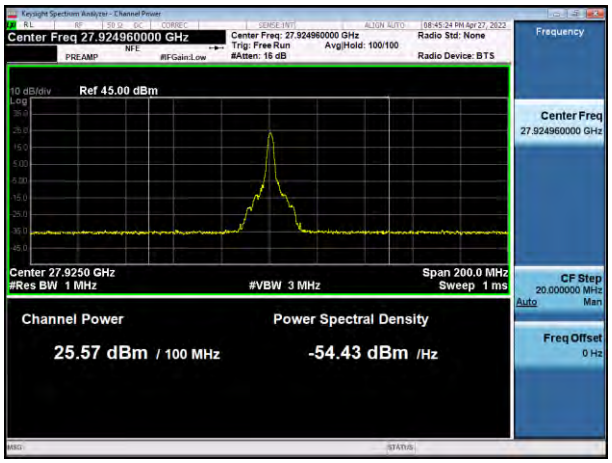
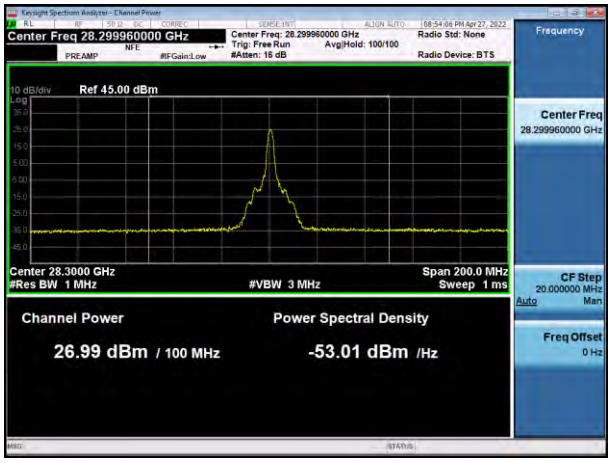
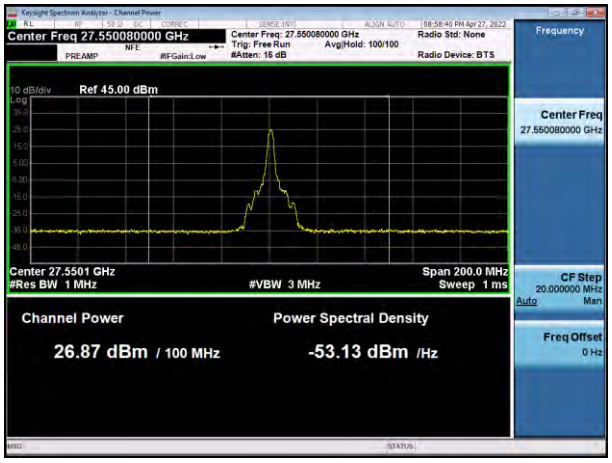
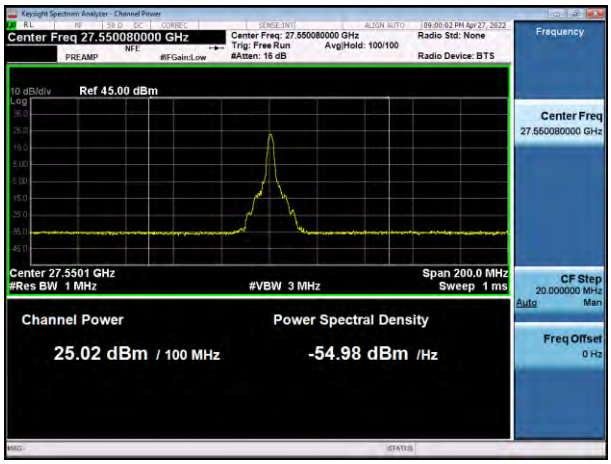
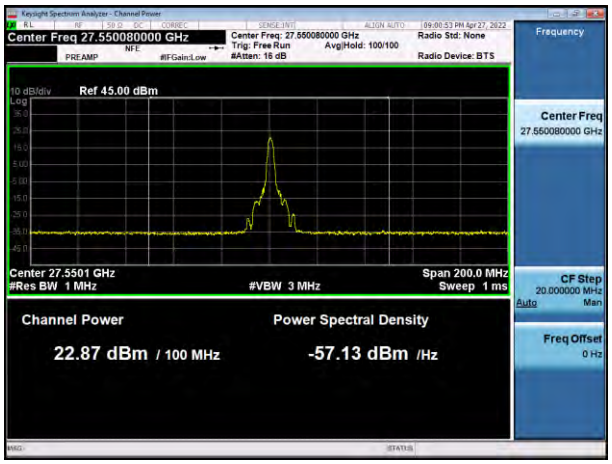
50 MHz, 1CC SISO	
	
	
	

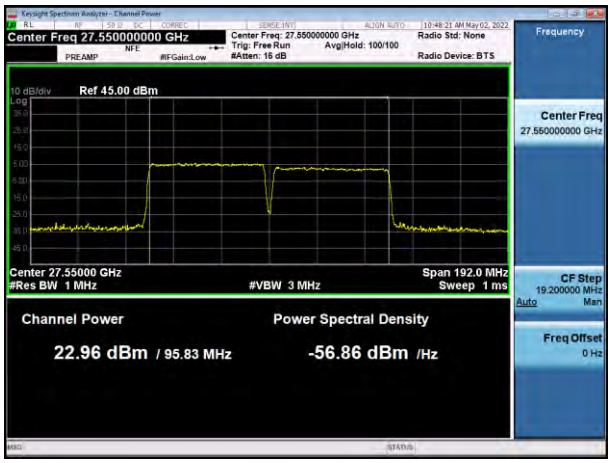
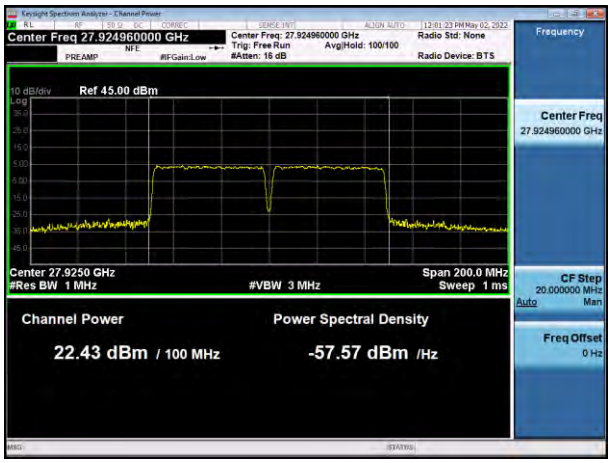
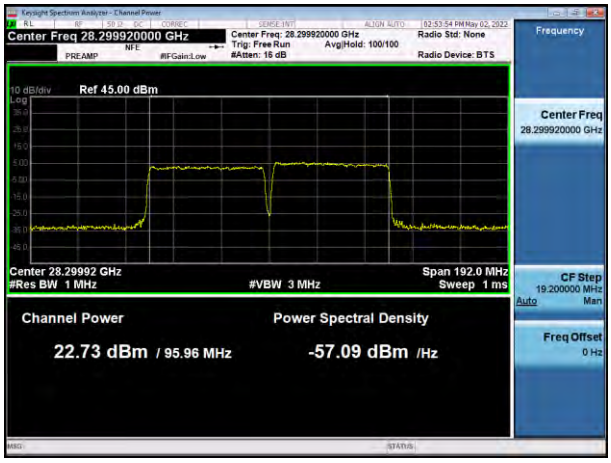
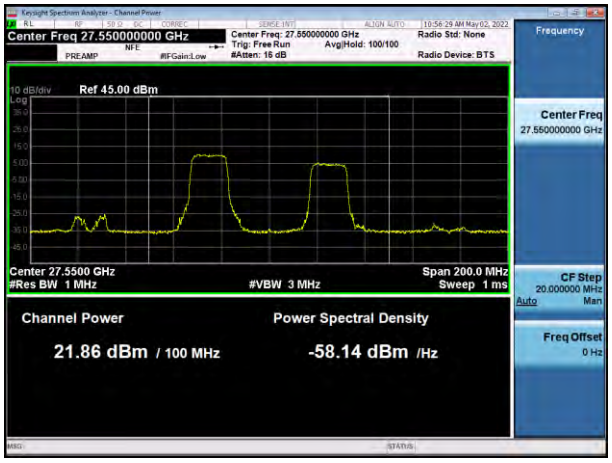
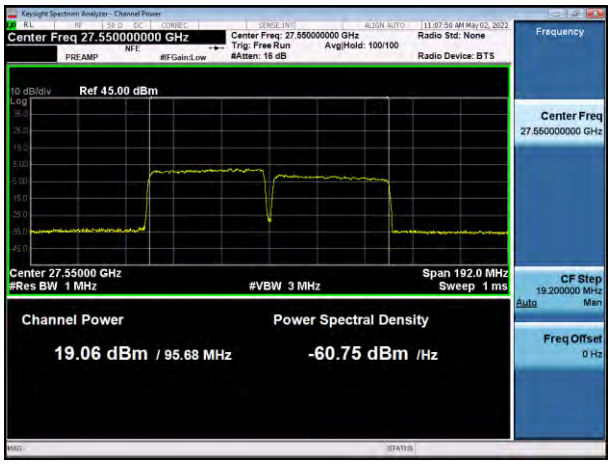
100 MHz, 1CC SISO	
	
	
	

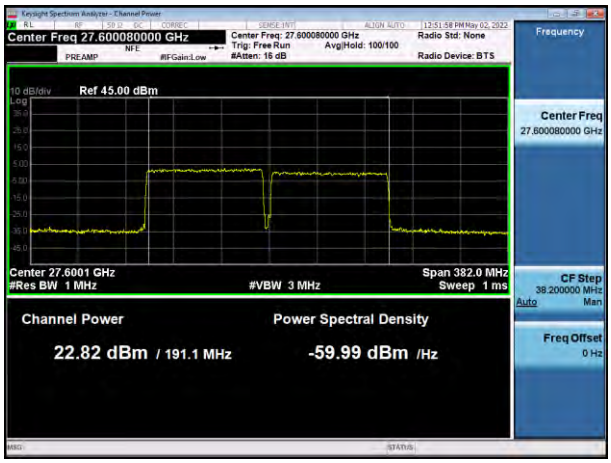
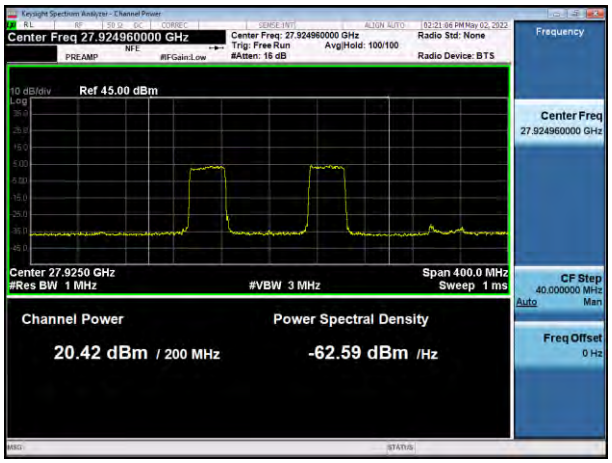
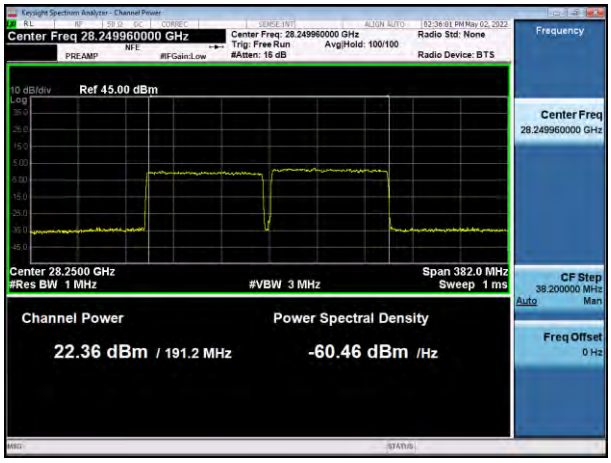
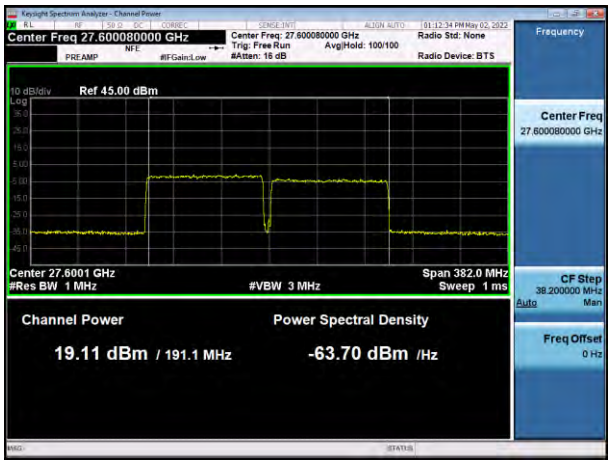
50 MHz, 2CC SISO	
	
	
	

100 MHz, 2CC SISO	
	
	
	

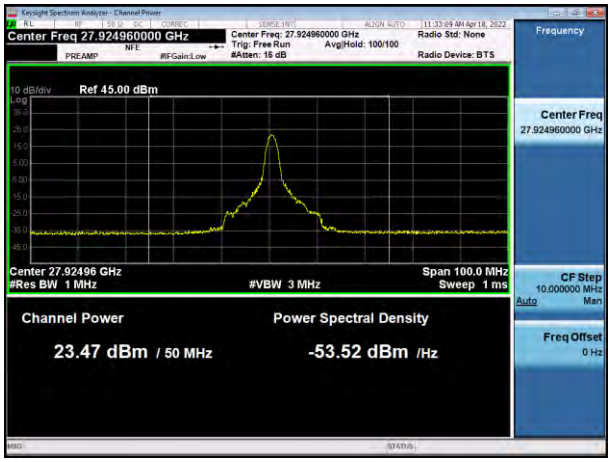
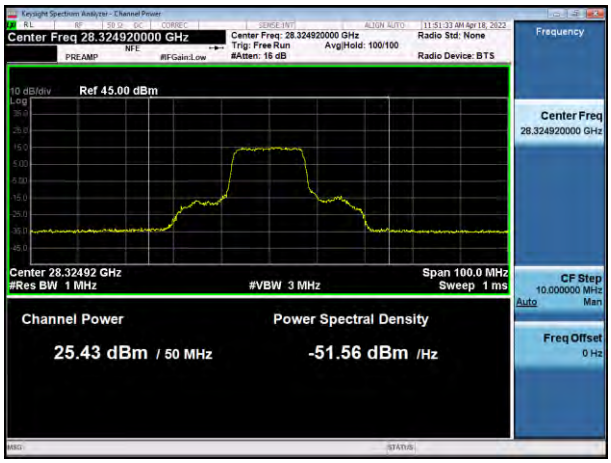
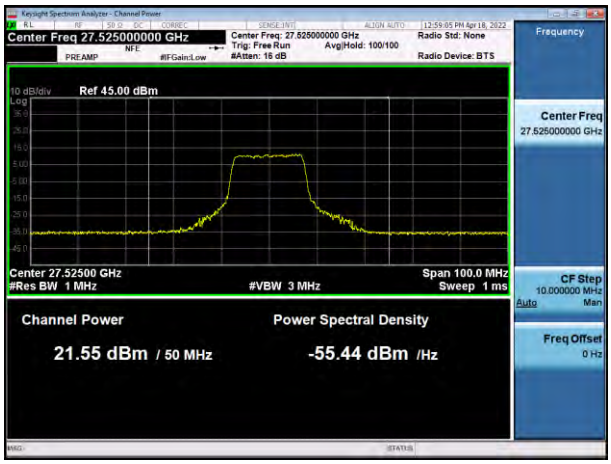
50 MHz, 1CC SISO Dual	
	
	
	

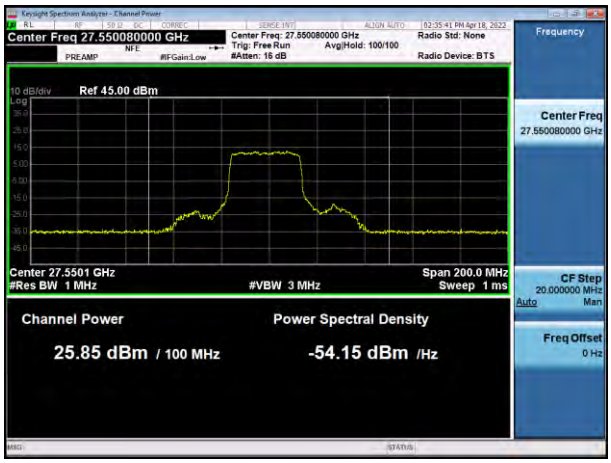
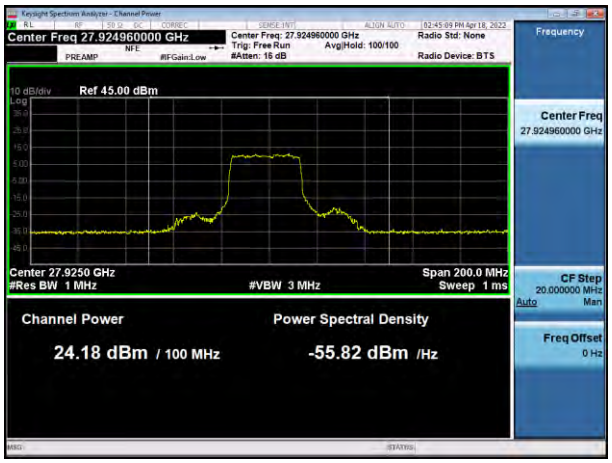
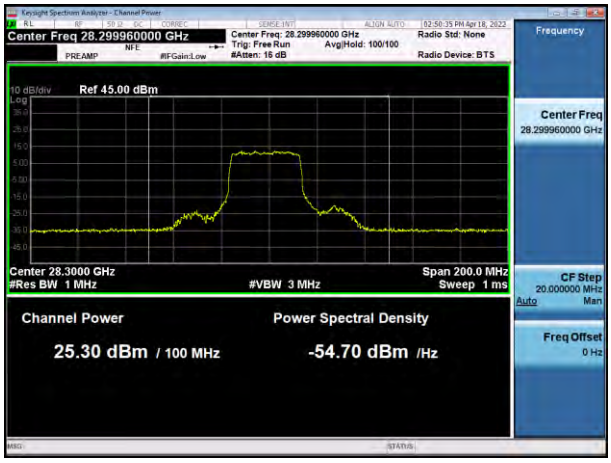
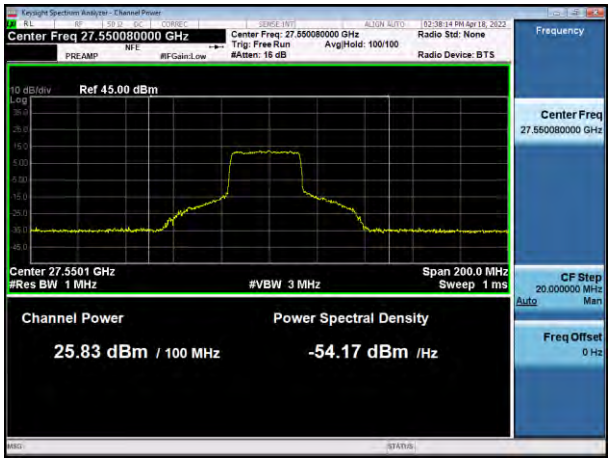
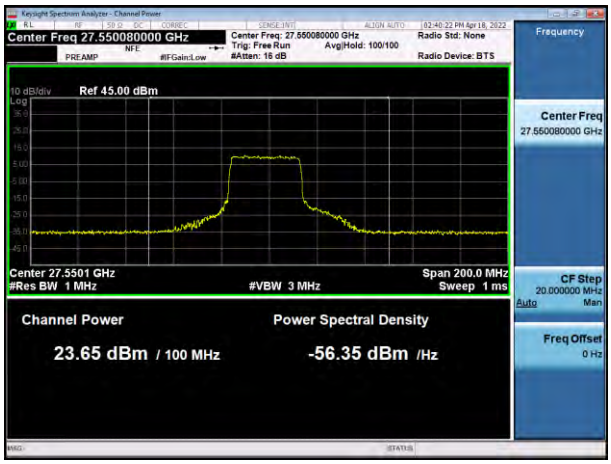
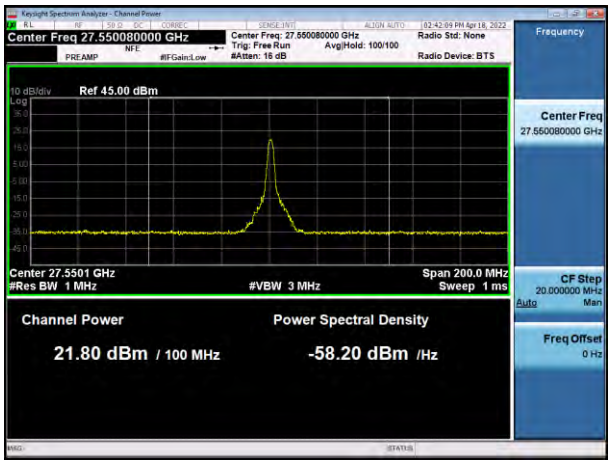
100 MHz, 1CC SISO Dual	
	
	
	

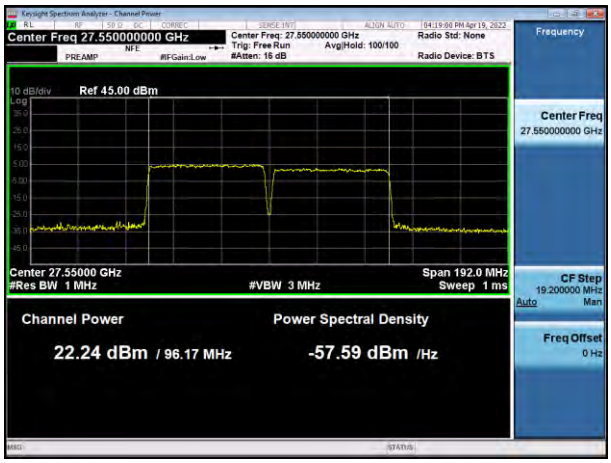
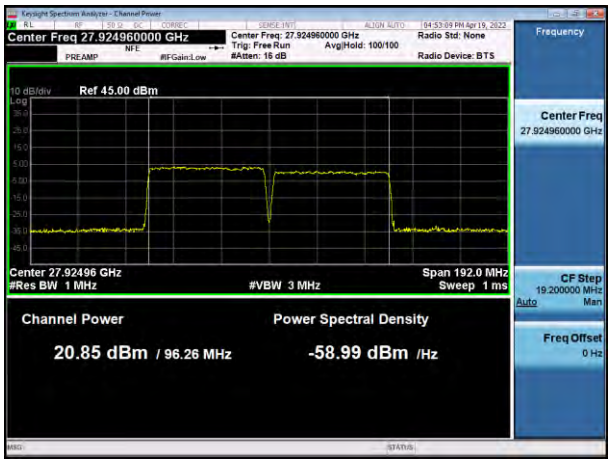
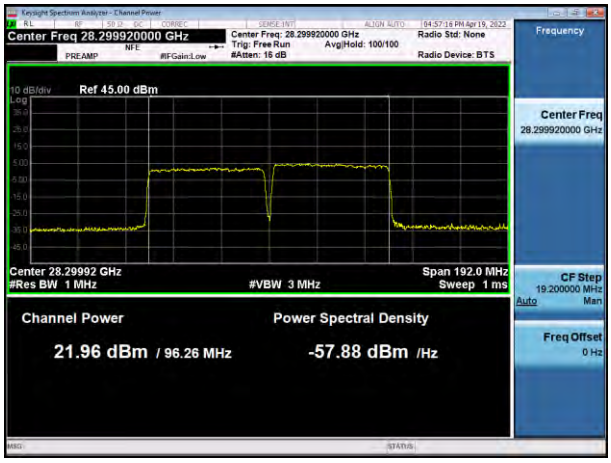
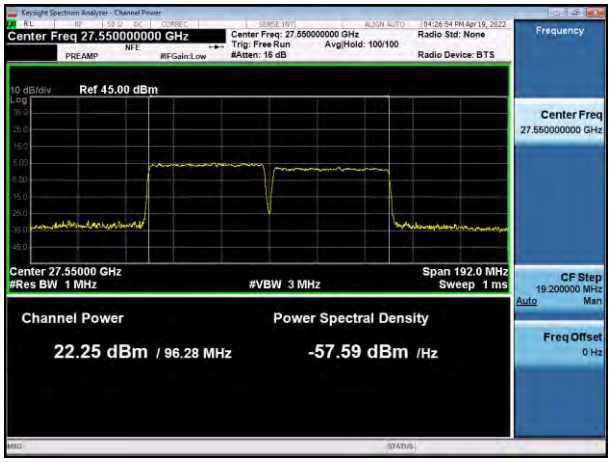
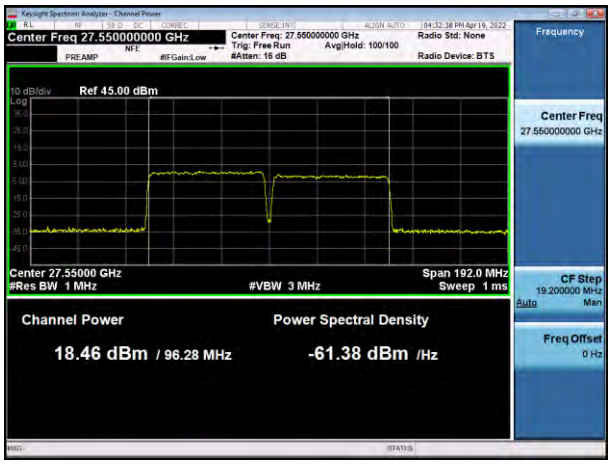
50 MHz, 2CC SISO Dual	
	
	
	

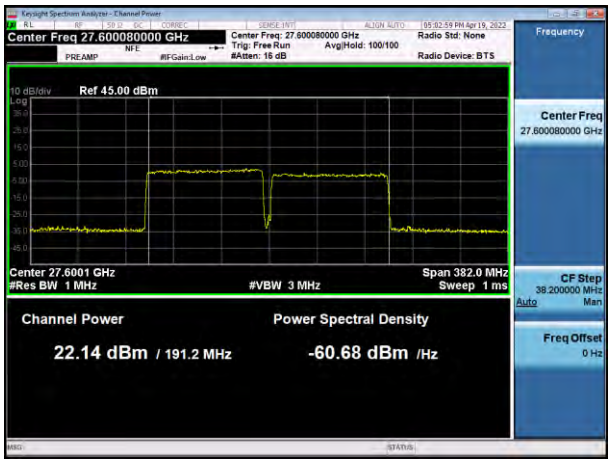
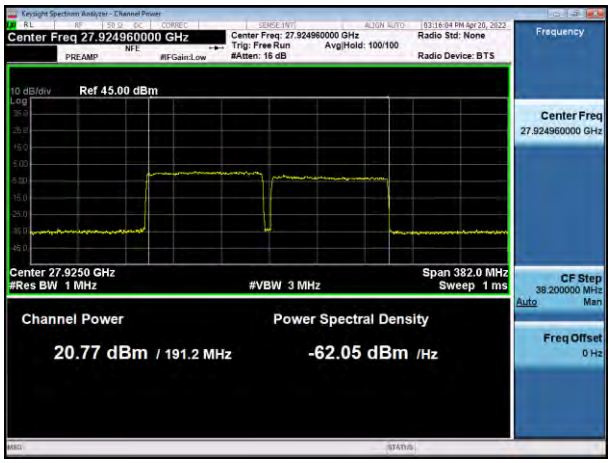
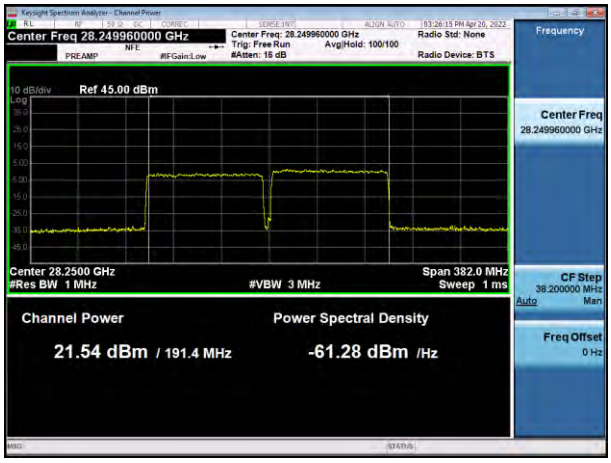
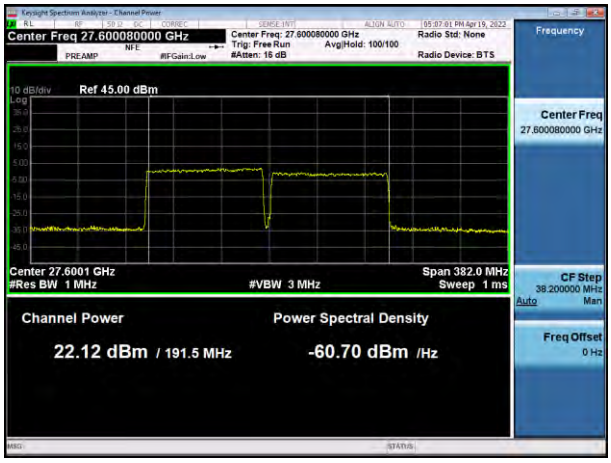
100 MHz, 2CC SISO Dual	
	
	
	

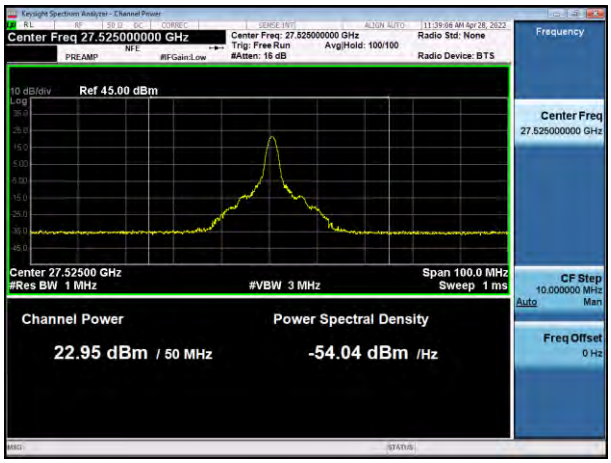
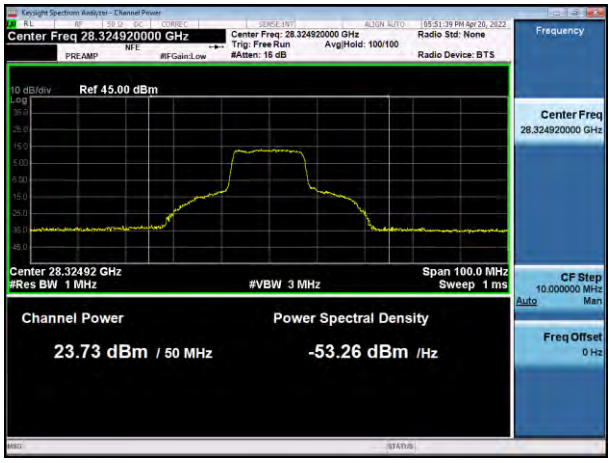
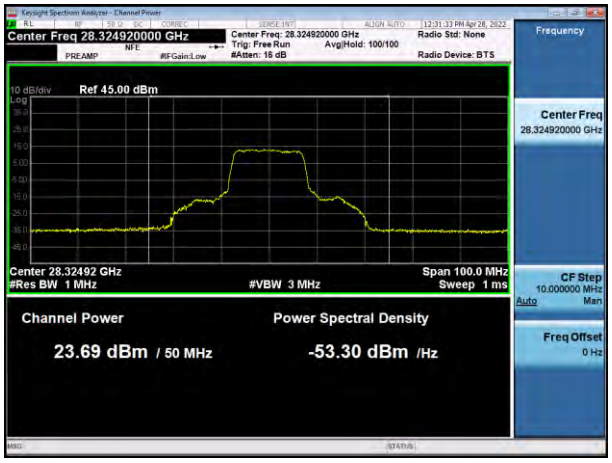
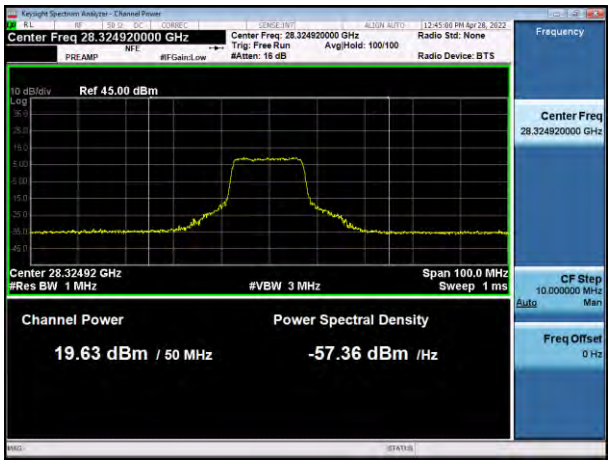
2. L patch: module 1, n261

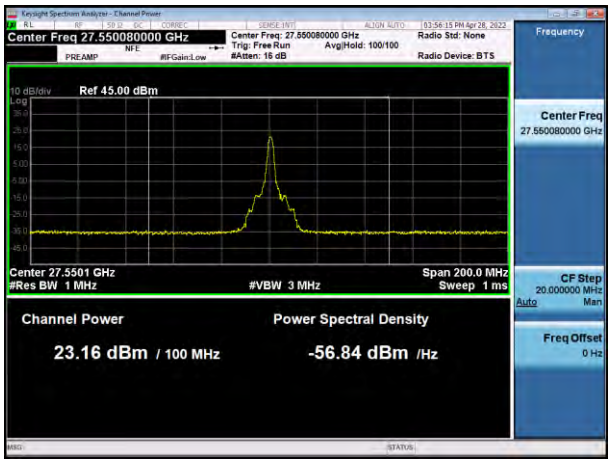
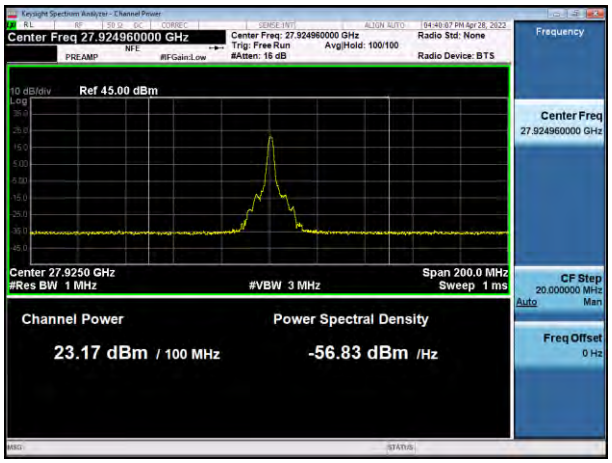
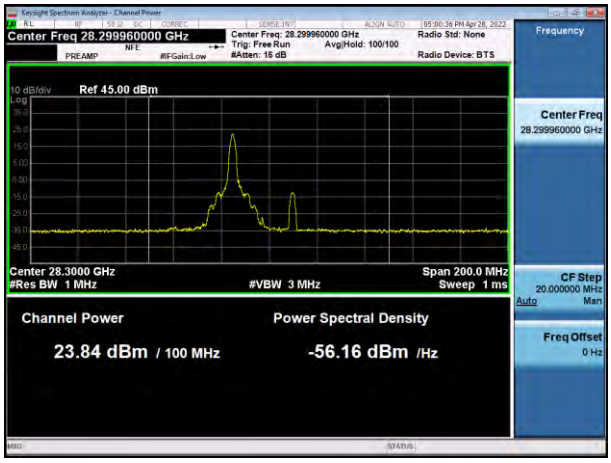
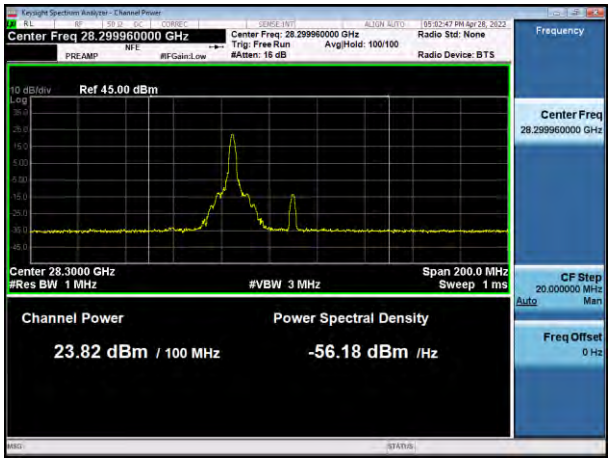
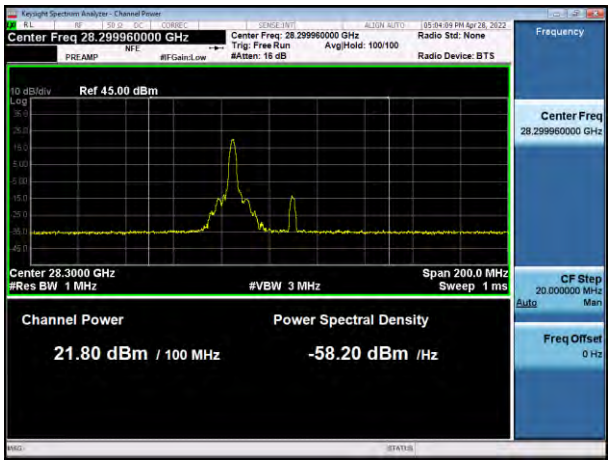
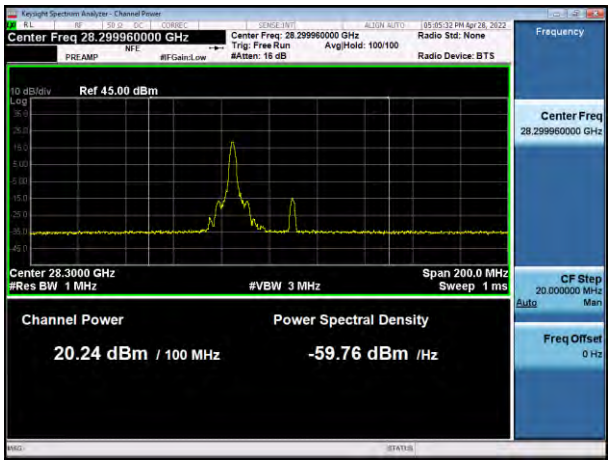
50 MHz, 1CC SISO	
	
	
	

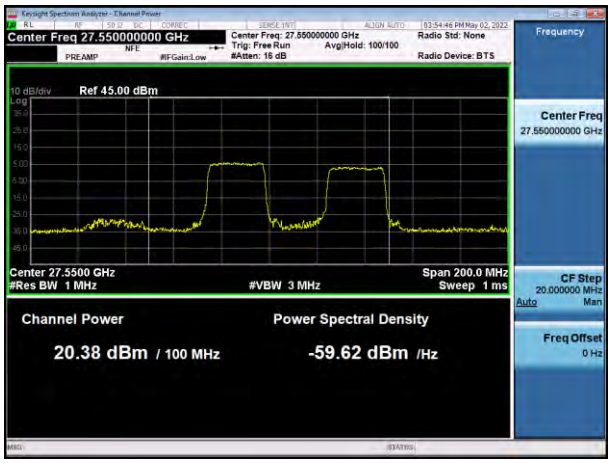
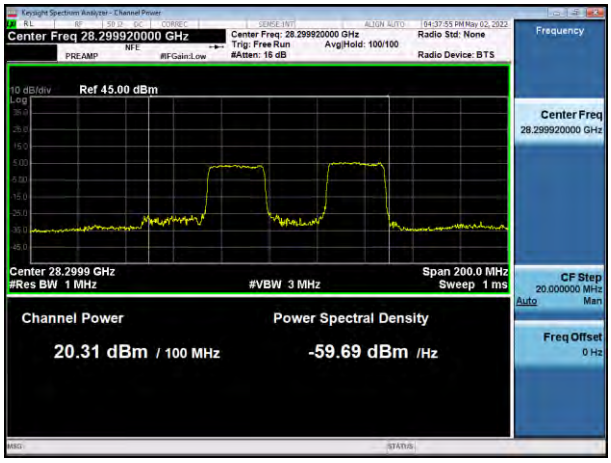
100 MHz, 1CC SISO	
	
	
	

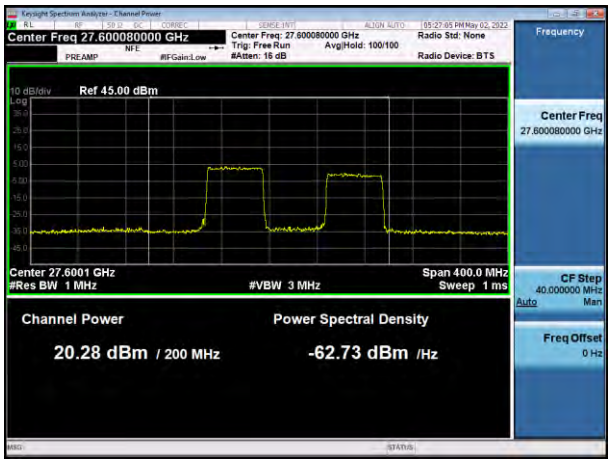
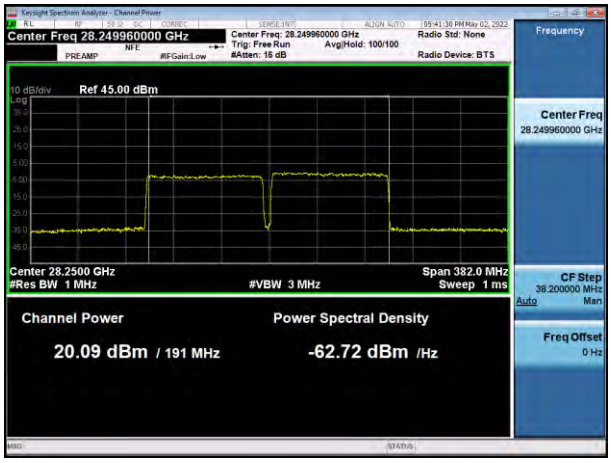
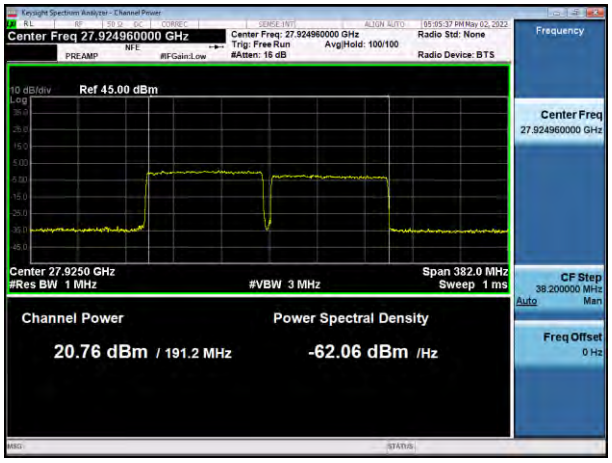
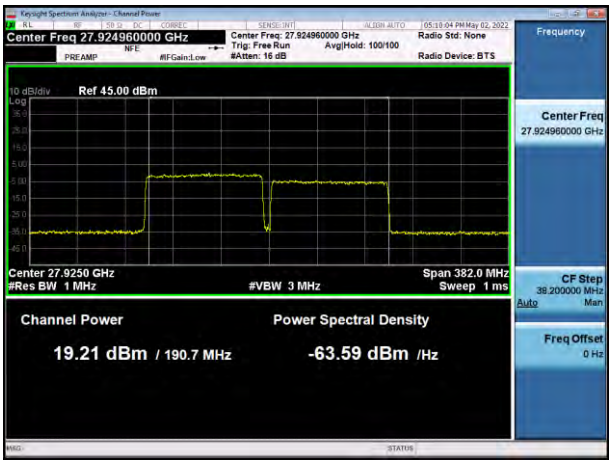
50 MHz, 2CC SISO	
	
	
	

100 MHz, 2CC SISO	
	
	
	

50 MHz, 1CC SISO Dual	
	
	
	

100 MHz, 1CC SISO Dual	
	
	
	

50 MHz, 2CC SISO Dual	
	
	
	

100 MHz, 2CC SISO Dual	
	
	
	

3. K patch: module 0, n260

50 MHz, 1CC SISO