

FCC 5G mmWave REPORT

Certification

Applicant Name:

SAMSUNG Electronics Co., Ltd.

Date of Issue:

July 10, 2020

Address:

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

Test Site/Location:

74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA

Report No.: HCT-RF-2007-FC017**FCC ID:** A3LSMT878U**APPLICANT:** SAMSUNG Electronics Co., Ltd.**Model:** SM-T878U**EUT Type:** Tablet**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 v01r01**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.

Report No.: HCT-RF-2007-FC017

REVIEWED BY



Report prepared by : Kwon Jeong
Engineer of Telecommunication Testing Center



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Manager of Telecommunication Testing Center

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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 KOLAS(Korea Laboratory Accreditation Scheme), which signed the ILAC-MRA. (HCT Accreditation No.: KT197)

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-2007-FC017	July 10, 2020	- First Approval Report

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1. EUT DESCRIPTION

Model	SM-T878U
Additional Model	-
EUT Type	Tablet
Power Supply	DC 3.85 V
Date(s) of Tests	June 05, 2020 ~ July 01, 2020
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, MIMO
Channel	Low, Mid, High
SCS	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	4 patches antenna 2ea(right side) Size: 23.24 mm x 4.2 mm

1.1 CHANNEL SPECIFICATIONS

Band	CC	BW	Channel	Frequency[MHz]	Channel No.
n261	1	50 MHz	Low	27534.84	2071413
			Mid	27923.52	2077891
			High	28319.52	2084491
		100 MHz	Low	27559.32	2071821
			Mid	27923.52	2077891
			High	28292.16	2084035
n260	1	50 MHz	Low	37027.32	2229621
			Mid	38497.44	2254123
			High	39966.24	2278603
		100 MHz	Low	37051.8	2230029
			Mid	38497.44	2254123
			High	39949.92	2278331

Band	CC	BW	Channel	Frequency [MHz]	Channel No.	Frequency [MHz]	Channel No.
				PCC		SCC	
n261	2	50 MHz	Low	27534.84	2071413	27584.88	2072247
			Mid	27898.56	2077475	27948.6	2078309
			High	28269.48	2083657	28319.52	2084491
		100 MHz	Low	27559.32	2071821	27659.28	2073487
			Mid	27873.48	2077057	27973.44	2078723
			High	28192.2	2082369	28292.16	2084035
n260	2	50 MHz	Low	37027.32	2229621	37077.36	2230455
			Mid	38472.36	2253705	38522.4	2254539
			High	39916.2	2277769	39966.24	2278603
		100 MHz	Low	37051.8	2230029	37151.76	2231695
			Mid	38447.4	2253289	38547.36	2254955
			High	39849.96	2276665	39949.92	2278331

Note: "CC" refers to "Component Carriers".

1.2 MAXIMUM EIRP POWER

n261 Band								
Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
					(W)	(dBm)		
SISO	Ant0(L patch)	50	1	27500 - 28350	0.117	20.68	45M6G7D	BPSK
SISO	Ant0(L patch)	50	1	27500 - 28350	0.134	21.28	45M4G7D	QPSK
SISO	Ant0(L patch)	50	1	27500 - 28350	0.117	20.69	45M2W7D	16QAM
SISO	Ant0(L patch)	50	1	27500 - 28350	0.090	19.54	45M6W7D	64QAM
MIMO	Ant0(L patch)	50	1	27500 - 28350	0.290	24.62	45M4G7D	QPSK
MIMO	Ant0(L patch)	50	1	27500 - 28350	0.131	21.17	45M4W7D	16QAM
MIMO	Ant0(L patch)	50	1	27500 - 28350	0.096	19.81	45M4W7D	64QAM
SISO	Ant0(L patch)	50	2	27500 - 28350	0.071	18.49	94M6G7D	BPSK
SISO	Ant0(L patch)	50	2	27500 - 28350	0.069	18.36	94M7G7D	QPSK
SISO	Ant0(L patch)	50	2	27500 - 28350	0.068	18.33	94M5W7D	16QAM
SISO	Ant0(L patch)	50	2	27500 - 28350	0.043	16.34	94M6W7D	64QAM
MIMO	Ant0(L patch)	50	2	27500 - 28350	0.126	21.01	94M6G7D	QPSK
MIMO	Ant0(L patch)	50	2	27500 - 28350	0.070	18.44	94M5W7D	16QAM
MIMO	Ant0(L patch)	50	2	27500 - 28350	0.038	15.75	94M6W7D	64QAM
SISO	Ant0(L patch)	100	1	27500 - 28350	0.118	20.72	90M5G7D	BPSK
SISO	Ant0(L patch)	100	1	27500 - 28350	0.123	20.91	90M7G7D	QPSK
SISO	Ant0(L patch)	100	1	27500 - 28350	0.114	20.58	90M8W7D	16QAM
SISO	Ant0(L patch)	100	1	27500 - 28350	0.056	17.52	90M7W7D	64QAM
MIMO	Ant0(L patch)	100	1	27500 - 28350	0.266	24.24	93M3G7D	QPSK
MIMO	Ant0(L patch)	100	1	27500 - 28350	0.117	20.70	93M1W7D	16QAM
MIMO	Ant0(L patch)	100	1	27500 - 28350	0.058	17.62	93M2W7D	64QAM
SISO	Ant0(L patch)	100	2	27500 - 28350	0.072	18.60	189MG7D	BPSK
SISO	Ant0(L patch)	100	2	27500 - 28350	0.070	18.47	189MG7D	QPSK
SISO	Ant0(L patch)	100	2	27500 - 28350	0.069	18.39	189MW7D	16QAM
SISO	Ant0(L patch)	100	2	27500 - 28350	0.042	16.26	189MW7D	64QAM
MIMO	Ant0(L patch)	100	2	27500 - 28350	0.104	20.16	191MG7D	QPSK
MIMO	Ant0(L patch)	100	2	27500 - 28350	0.071	18.52	191MW7D	16QAM
MIMO	Ant0(L patch)	100	2	27500 - 28350	0.040	15.99	192MW7D	64QAM
SISO	Ant1(K patch)	50	1	27500 - 28350	0.320	25.05	45M5G7D	BPSK
SISO	Ant1(K patch)	50	1	27500 - 28350	0.261	24.16	45M5G7D	QPSK
SISO	Ant1(K patch)	50	1	27500 - 28350	0.248	23.95	45M4W7D	16QAM
SISO	Ant1(K patch)	50	1	27500 - 28350	0.125	20.98	45M5W7D	64QAM
MIMO	Ant1(K patch)	50	1	27500 - 28350	0.376	25.75	45M4G7D	QPSK
MIMO	Ant1(K patch)	50	1	27500 - 28350	0.262	24.19	45M5W7D	16QAM
MIMO	Ant1(K patch)	50	1	27500 - 28350	0.212	23.27	45M6W7D	64QAM
SISO	Ant1(K patch)	50	2	27500 - 28350	0.169	22.29	94M5G7D	BPSK
SISO	Ant1(K patch)	50	2	27500 - 28350	0.166	22.19	94M5G7D	QPSK
SISO	Ant1(K patch)	50	2	27500 - 28350	0.166	22.20	94M3W7D	16QAM
SISO	Ant1(K patch)	50	2	27500 - 28350	0.102	20.07	94M4W7D	64QAM
MIMO	Ant1(K patch)	50	2	27500 - 28350	0.190	22.79	94M8G7D	QPSK

n261 Band								
Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
					(W)	(dBm)		
MIMO	Ant1(K patch)	50	2	27500 - 28350	0.177	22.49	94M7W7D	16QAM
MIMO	Ant1(K patch)	50	2	27500 - 28350	0.101	20.05	94M8W7D	64QAM
SISO	Ant1(K patch)	100	1	27500 - 28350	0.288	24.59	90M2G7D	BPSK
SISO	Ant1(K patch)	100	1	27500 - 28350	0.267	24.27	90M3G7D	QPSK
SISO	Ant1(K patch)	100	1	27500 - 28350	0.270	24.32	90M4W7D	16QAM
SISO	Ant1(K patch)	100	1	27500 - 28350	0.198	22.96	90M5W7D	64QAM
MIMO	Ant1(K patch)	100	1	27500 - 28350	0.392	25.94	93M2G7D	QPSK
MIMO	Ant1(K patch)	100	1	27500 - 28350	0.311	24.93	92M9W7D	16QAM
MIMO	Ant1(K patch)	100	1	27500 - 28350	0.142	21.54	93M2W7D	64QAM
SISO	Ant1(K patch)	100	2	27500 - 28350	0.171	22.32	189MG7D	BPSK
SISO	Ant1(K patch)	100	2	27500 - 28350	0.152	21.82	189MG7D	QPSK
SISO	Ant1(K patch)	100	2	27500 - 28350	0.151	21.80	189MW7D	16QAM
SISO	Ant1(K patch)	100	2	27500 - 28350	0.096	19.84	189MW7D	64QAM
MIMO	Ant1(K patch)	100	2	27500 - 28350	0.195	22.90	192MG7D	QPSK
MIMO	Ant1(K patch)	100	2	27500 - 28350	0.181	22.59	192MW7D	16QAM
MIMO	Ant1(K patch)	100	2	27500 - 28350	0.099	19.95	192MW7D	64QAM

n260 Band								
Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
					(W)	(dBm)		
SISO	Ant0(L patch)	50	1	37000 - 40000	0.173	22.37	45M6G7D	BPSK
SISO	Ant0(L patch)	50	1	37000 - 40000	0.165	22.18	45M9G7D	QPSK
SISO	Ant0(L patch)	50	1	37000 - 40000	0.098	19.93	45M7W7D	16QAM
SISO	Ant0(L patch)	50	1	37000 - 40000	0.074	18.72	46M2W7D	64QAM
MIMO	Ant0(L patch)	50	1	37000 - 40000	0.362	25.59	45M7G7D	QPSK
MIMO	Ant0(L patch)	50	1	37000 - 40000	0.116	20.66	46M0W7D	16QAM
MIMO	Ant0(L patch)	50	1	37000 - 40000	0.077	18.84	46M5W7D	64QAM
SISO	Ant0(L patch)	50	2	37000 - 40000	0.107	20.29	94M6G7D	BPSK
SISO	Ant0(L patch)	50	2	37000 - 40000	0.106	20.27	94M3G7D	QPSK
SISO	Ant0(L patch)	50	2	37000 - 40000	0.105	20.22	94M6W7D	16QAM
SISO	Ant0(L patch)	50	2	37000 - 40000	0.046	16.59	94M7W7D	64QAM
MIMO	Ant0(L patch)	50	2	37000 - 40000	0.189	22.77	94M5G7D	QPSK
MIMO	Ant0(L patch)	50	2	37000 - 40000	0.072	18.56	94M5W7D	16QAM
MIMO	Ant0(L patch)	50	2	37000 - 40000	0.039	15.90	94M4W7D	64QAM
SISO	Ant0(L patch)	100	1	37000 - 40000	0.169	22.27	92M0G7D	BPSK
SISO	Ant0(L patch)	100	1	37000 - 40000	0.092	19.64	92M0G7D	QPSK
SISO	Ant0(L patch)	100	1	37000 - 40000	0.095	19.77	92M5W7D	16QAM
SISO	Ant0(L patch)	100	1	37000 - 40000	0.070	18.47	90M8W7D	64QAM
MIMO	Ant0(L patch)	100	1	37000 - 40000	0.347	25.40	94M4G7D	QPSK
MIMO	Ant0(L patch)	100	1	37000 - 40000	0.112	20.50	94M5W7D	16QAM
MIMO	Ant0(L patch)	100	1	37000 - 40000	0.088	19.45	93M9W7D	64QAM
SISO	Ant0(L patch)	100	2	37000 - 40000	0.097	19.87	189MG7D	BPSK
SISO	Ant0(L patch)	100	2	37000 - 40000	0.059	17.68	189MG7D	QPSK
SISO	Ant0(L patch)	100	2	37000 - 40000	0.058	17.60	189MW7D	16QAM
SISO	Ant0(L patch)	100	2	37000 - 40000	0.032	15.11	190MW7D	64QAM
MIMO	Ant0(L patch)	100	2	37000 - 40000	0.117	20.69	192MG7D	QPSK
MIMO	Ant0(L patch)	100	2	37000 - 40000	0.058	17.61	191MW7D	16QAM
MIMO	Ant0(L patch)	100	2	37000 - 40000	0.031	14.85	193MW7D	64QAM
SISO	Ant1(K patch)	50	1	37000 - 40000	0.155	21.89	45M6G7D	BPSK
SISO	Ant1(K patch)	50	1	37000 - 40000	0.081	19.11	45M5G7D	QPSK
SISO	Ant1(K patch)	50	1	37000 - 40000	0.072	18.60	45M5W7D	16QAM
SISO	Ant1(K patch)	50	1	37000 - 40000	0.042	16.24	45M5W7D	64QAM
MIMO	Ant1(K patch)	50	1	37000 - 40000	0.281	24.49	46M0G7D	QPSK
MIMO	Ant1(K patch)	50	1	37000 - 40000	0.101	20.05	46M0W7D	16QAM
MIMO	Ant1(K patch)	50	1	37000 - 40000	0.071	18.50	46M6W7D	64QAM
SISO	Ant1(K patch)	50	2	37000 - 40000	0.095	19.80	94M7G7D	BPSK
SISO	Ant1(K patch)	50	2	37000 - 40000	0.054	17.29	94M7G7D	QPSK
SISO	Ant1(K patch)	50	2	37000 - 40000	0.049	16.92	94M5W7D	16QAM
SISO	Ant1(K patch)	50	2	37000 - 40000	0.032	15.06	94M7W7D	64QAM
MIMO	Ant1(K patch)	50	2	37000 - 40000	0.116	20.66	94M8G7D	QPSK
MIMO	Ant1(K patch)	50	2	37000 - 40000	0.058	17.64	95M0W7D	16QAM

n260 Band								
Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
					(W)	(dBm)		
MIMO	Ant1(K patch)	50	2	37000 - 40000	0.033	15.12	94M7W7D	64QAM
SISO	Ant1(K patch)	100	1	37000 - 40000	0.133	21.25	91M7G7D	BPSK
SISO	Ant1(K patch)	100	1	37000 - 40000	0.091	19.61	90M6G7D	QPSK
SISO	Ant1(K patch)	100	1	37000 - 40000	0.073	18.66	90M7W7D	16QAM
SISO	Ant1(K patch)	100	1	37000 - 40000	0.044	16.40	90M7W7D	64QAM
MIMO	Ant1(K patch)	100	1	37000 - 40000	0.263	24.20	94M9G7D	QPSK
MIMO	Ant1(K patch)	100	1	37000 - 40000	0.114	20.59	93M4W7D	16QAM
MIMO	Ant1(K patch)	100	1	37000 - 40000	0.067	18.29	93M5W7D	64QAM
SISO	Ant1(K patch)	100	2	37000 - 40000	0.090	19.52	189MG7D	BPSK
SISO	Ant1(K patch)	100	2	37000 - 40000	0.054	17.32	188MG7D	QPSK
SISO	Ant1(K patch)	100	2	37000 - 40000	0.054	17.30	188MW7D	16QAM
SISO	Ant1(K patch)	100	2	37000 - 40000	0.030	14.80	189MW7D	64QAM
MIMO	Ant1(K patch)	100	2	37000 - 40000	0.127	21.05	191MG7D	QPSK
MIMO	Ant1(K patch)	100	2	37000 - 40000	0.061	17.89	191MW7D	16QAM
MIMO	Ant1(K patch)	100	2	37000 - 40000	0.033	15.16	192MW7D	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

Detailed description of test facility was submitted to the Commission and accepted dated April 02, 2018 (Registration Number: KR0032). The full scope of accreditation can be viewed at https://apps.fcc.gov/oetcf/eas/reports/ViewTestFirmAccredScopes.cfm?calledFromFrame=N&RequestTimeOut=500®num_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 v01r01

Note:

The EUT was tested per the guidance of ANSI C63.26-2015, KDB 971168 D01 v03r01, KDB 842590 D01 v01r01.

EIRP Simulation data for all Beam IDs was used to determine the worst case Beam ID for SISO operation and Beam ID pair for MIMO 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).

L patch antenna does not radiate when K patch antenna radiates.

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

In case of MIMO mode, only CP-OFDM is supported.

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.

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

Ant 0(L patch) SISO

Band	CH	Beam ID	SISIO - H	Beam ID	SISO - V
n261	Low	150	H / Azi : 28 Roll : 272	23	H / Azi : 16 Roll : 226
	Mid	150	H / Azi : 30 Roll : 272	14	V / Azi : 15 Roll : 154
	High	140	H / Azi : 45 Roll : 270	24	V / Azi : 15 Roll : 135
n260	Low	142	H / Azi : 5 Roll : 125	23	H / Azi : 30 Roll : 230
	Mid	141	H / Azi : 32 Roll : 320	23	H / Azi : 30 Roll : 230
	High	152	H / Azi : 15 Roll : 150	15	V / Azi : 15 Roll : 122

Ant 0(L patch) MIMO

Band	CH	Beam ID	MIMO - H	Beam ID	MIMO - V
n261	Low	12/140	H / Azi : 45 Roll : 272	12/140	V / Azi : 45 Roll : 315
	Mid	22/150	H / Azi : 30 Roll : 290	22/150	V / Azi : 45 Roll : 242
	High	24/152	H / Azi : 2 Roll : 290	24/152	V / Azi : 45 Roll : 168
n260	Low	24/152	H / Azi : 30 Roll : 165	24/152	V / Azi : 30 Roll : 15
	Mid	23/151	H / Azi : 15 Roll : 285	23/151	V / Azi : 30 Roll : 346
	High	24/152	H / Azi : 15 Roll : 46	24/152	V / Azi : 15 Roll : 108

Ant 1(K patch) SISO

Band	CH	Beam ID	SISIO - H	Beam ID	SISO - V
n261	Low	155	V / Azi : 15 Roll : 212	27	V / Azi : 15 Roll : 315
	Mid	155	V / Azi : 15 Roll : 214	27	V / Azi : 15 Roll : 332
	High	155	V / Azi : 15 Roll : 300	27	V / Azi : 15 Roll : 244
n260	Low	156	V / Azi : 30 Roll : 32	18	V / Azi : 45 Roll : 315
	Mid	156	V / Azi : 30 Roll : 15	28	V / Azi : 30 Roll : 360
	High	157	V / Azi : 30 Roll : 46	28	V / Azi : 30 Roll : 2

Ant 1(K patch) MIMO

Band	CH	Beam ID	MIMO - H	Beam ID	MIMO - V
n261	Low	27/155	H / Azi : 15 Roll : 285	27/155	V / Azi : 16 Roll : 285
	Mid	27/155	H / Azi : 15 Roll : 286	27/155	V / Azi : 16 Roll : 286
	High	19/147	H / Azi : 15 Roll : 75	19/147	V / Azi : 15 Roll : 75
n260	Low	20/148	H / Azi : 60 Roll : 152	20/148	V / Azi : 30 Roll : 46
	Mid	28/156	H / Azi : 16 Roll : 45	28/156	V / Azi : 32 Roll : 15
	High	20/148	H / Azi : 32 Roll : 45	20/148	V / Azi : 32 Roll : 45

3.3. MAXIMUM MEASUREMENT UNCERTAINTY

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

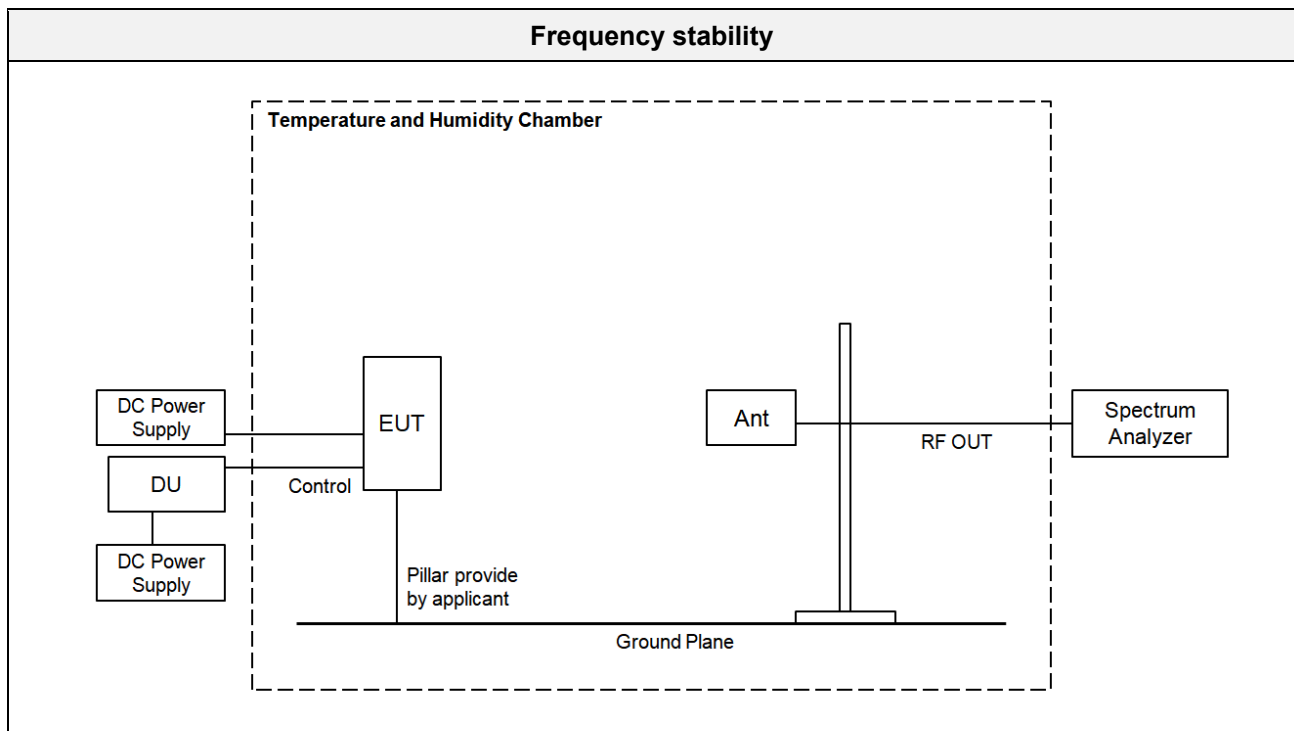
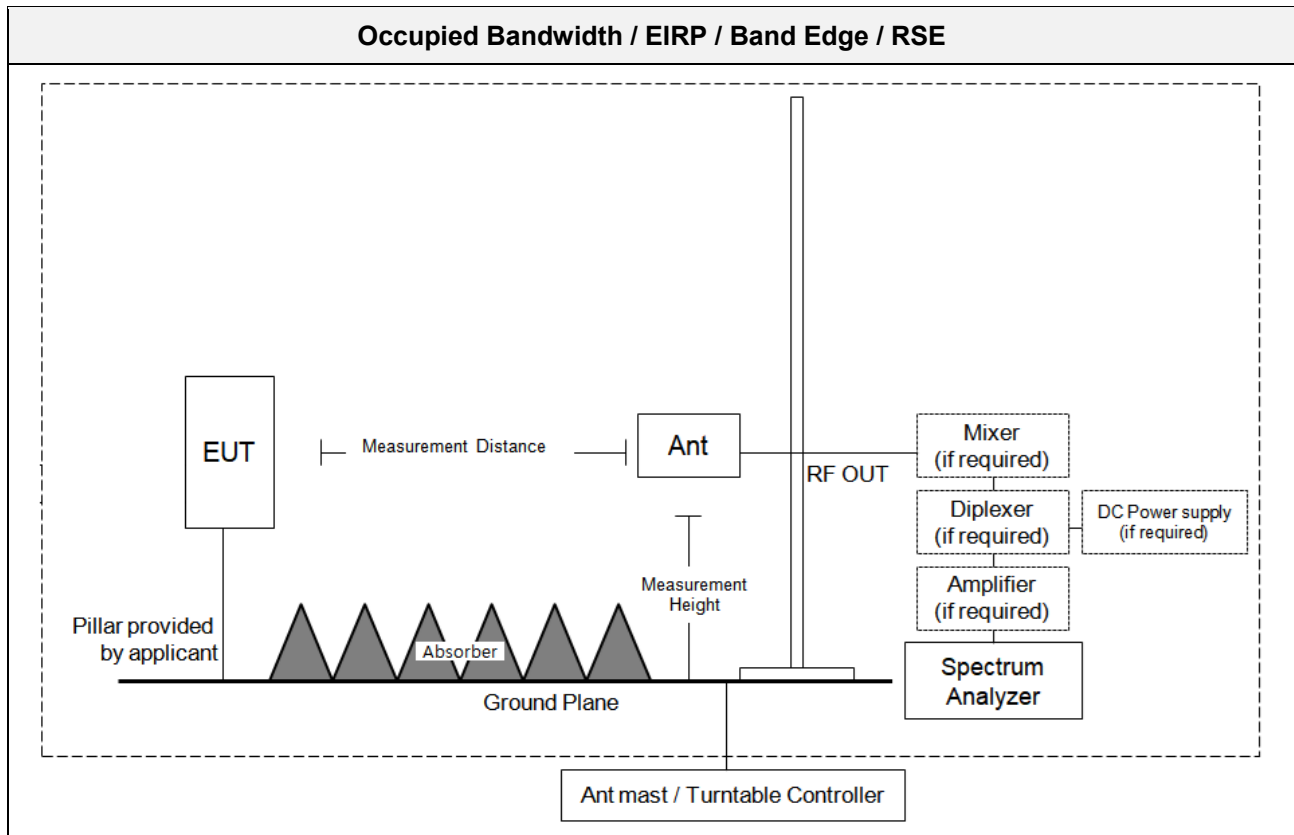
Coverage factor $k = 2$, Confidence levels of 95 %

Description	Condition	Uncertainty
Occupied Bandwidth	-	± 0.31 MHz
Equivalent Isotropic Radiated Power	28 GHz	± 5.05 dB
Band Edge		
Radiated Spurious Emissions	9 kHz ~ 30 MHz	± 3.40 dB
	30 MHz ~ 1 GHz	± 4.80 dB
	1 GHz ~ 18 GHz	± 5.70 dB
	18 GHz ~ 40 GHz	± 5.05 dB
	40 GHz ~ 200 GHz	± 4.59 dB
Frequency Stability	-	69.61 kHz

3.4. STANDARDS ENVIRONMENTAL TEST CONDITIONS

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

3.5. TEST DIAGRAMS



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.

$$\text{Wavelength} = \text{Speed of light} / \text{Measurement frequency} = 30 / 4\,000 = 0.0075$$

$$(2 \times (\text{Max measured antenna dimension})^2) / \text{Wavelength} = (2 \times (0.09604686)^2) / 0.0075 = \mathbf{2.46\,m}$$

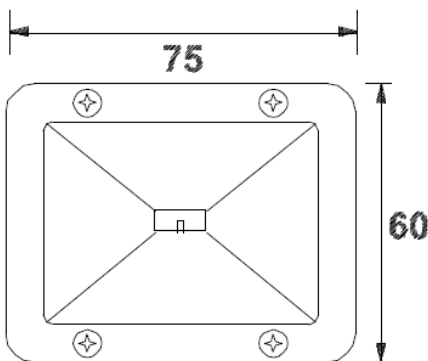
: Spurious emissions measurement distance is shown in table below(Reference : Measurement Antenna Dimension).

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	3.75
60 ~90	0.33	0.856	1
90 ~ 140	0.214	0.572	1
140 ~ 200	0.15	0.332	0.5

- 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: 0.09604686 m,



- Dimension of EUT antenna : 0.02361647 mm

- Below 18 GHz, measurement distance is 3.75 m.

4. TEST EQUIPMENTS

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Agilent	N9030B / PXA Signal Analyzer	03/27/2020	Annual	MY55480167
Schwarzbeck	BBHA 9170 / Horn Antenna	11/29/2019	Biennial	BBHA9170541
KIKUSUI	PWR800L / DC Power Supply	07/18/2019	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	09/09/2019	Annual	101256
Rohde&Schwarz	FSP / Spectrum Analyzer	09/11/2019	Annual	836650/016
Schwarzbeck	Loop Antenna	04/26/2019	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	08/31/2018	Biennial	9168-895
Schwarzbeck	BBHA 9120D / Horn Antenna	06/28/2019	Biennial	9120D-1300
OML INC.	WR-19 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M19RH-160419-2
OML INC.	WR-19 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M19RH-160419-1
OML INC.	WR-12 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M12RH-160419-1
OML INC.	WR-12 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M12RH-160419-2
OML INC.	WR-08 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M08RH-160419-2
OML INC.	WR-08 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M08RH-160419-1
OML INC.	WR-05 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M05RH-160419-1
OML INC.	WR-05 Horn Antenna / Horn Antenna	04/23/2020	Biennial	M05RH-160419-2
OML INC.	OML WR19 / Harmonic Mixer	09/09/2019	Annual	M19HWD
OML INC.	OML WR12 / Harmonic Mixer	09/09/2019	Annual	M12HWD
OML INC.	OML WR08 / Harmonic Mixer	09/09/2019	Annual	W08HWD
OML INC.	OML WR05 / Harmonic Mixer	09/09/2019	Annual	M05HWD
OML INC.	WR-19 / Source Module	11/19/2019	Annual	S19MS-A-160516-1
OML INC.	WR-12 / Source Module	09/09/2019	Annual	S12MS-A-160419-1
OML INC.	WR-08 / Source Module	09/09/2019	Annual	S08MS-A-160419-1
OML INC.	WR-05 / Source Module	07/22/2019	Annual	S05MS-A-160419-1
NANGYEUL CO., LTD.	NY-THR18750 / Temperature and Humidity Chamber	12/16/2019	Annual	NY-200912201A
Rohde & Schwarz	SMV100A / Signal Generator	07/15/2019	Annual	177633
Keysight	E7515B / UXM 5G Wireless Test Platform	01/07/2020	Annual	MY58300756

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 $\geq 3 \times \text{RBW}$.

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 $1.5 \times \text{OBW}$ 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 $\geq 3 \times \text{RBW}$.
- 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

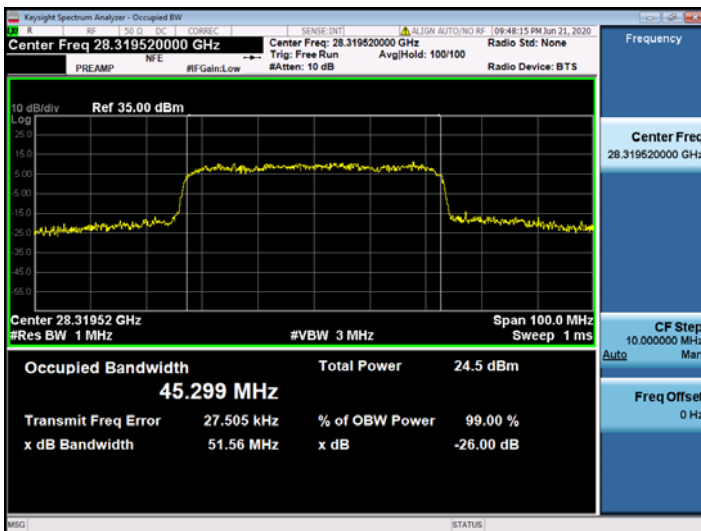
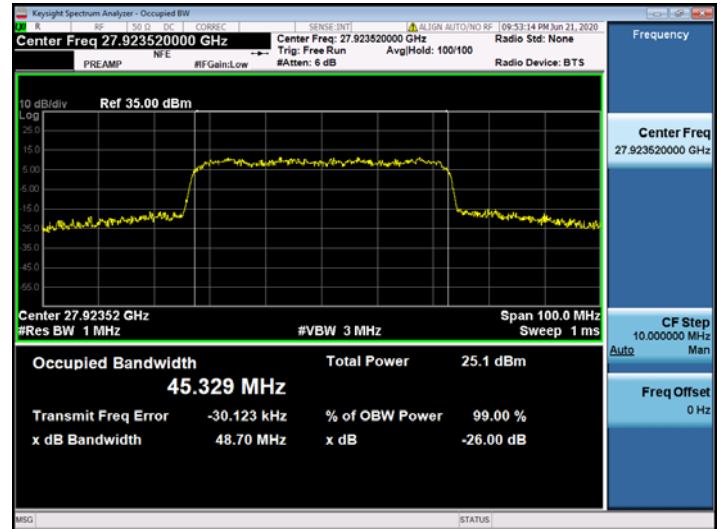
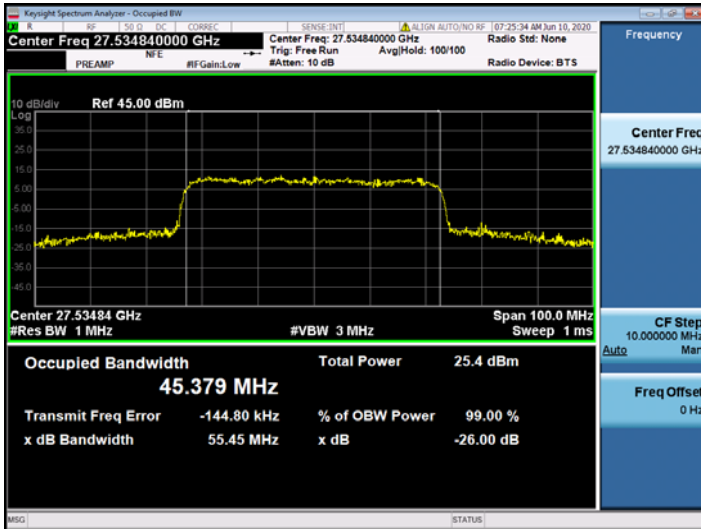
Band	Antenna	CCs Active	Bandwidth	Modulation	Channel	Frequency [MHz]	OBW [MHz]
n261	0(L patch)	1	50 MHz	QPSK	Low	27534.84	45.379
					Mid	27923.52	45.329
					High	28319.52	45.299
			100 MHz		Low	27559.32	93.264
					Mid	27923.52	93.083
					High	28292.16	93.424
		2	50 MHz		Low	27559.84	94.582
					Mid	27923.52	94.431
					High	28294.52	94.546
			100 MHz		Low	27609.32	191.430
					Mid	27923.52	191.690
					High	28242.16	191.740
	1(K patch)	1	50 MHz	QPSK	Low	27534.84	45.352
					Mid	27923.52	45.407
					High	28319.52	45.393
			100 MHz		Low	27559.32	93.231
					Mid	27923.52	92.836
					High	28292.16	93.083
		2	50 MHz		Low	27559.84	94.815
					Mid	27923.52	94.635
					High	28294.52	94.738
			100 MHz		Low	27609.32	191.610
					Mid	27923.52	191.640
					High	28242.16	191.470

Band	Antenna	CCs Active	Bandwidth	Modulation	Channel	Frequency [MHz]	OBW [MHz]
n260	0(L patch)	1	50 MHz	QPSK	Low	37027.32	45.723
					Mid	38497.44	45.556
					High	39966.24	45.570
			100 MHz		Low	37051.80	94.449
					Mid	38497.44	93.146
					High	39949.92	93.497
		2	50 MHz		Low	37052.32	94.503
					Mid	38497.44	94.778
					High	39941.24	94.484
			100 MHz		Low	37101.80	191.580
					Mid	38497.44	191.160
					High	39899.92	190.920
	1(K patch)	1	50 MHz	QPSK	Low	37027.32	46.016
					Mid	38497.44	45.665
					High	39966.24	46.001
			100 MHz		Low	37051.80	94.867
					Mid	38497.44	93.175
					High	39949.92	93.418
		2	50 MHz		Low	37052.32	94.810
					Mid	38497.44	94.461
					High	39941.24	94.565
			100 MHz		Low	37101.80	191.320
					Mid	38497.44	191.150
					High	39899.92	191.080

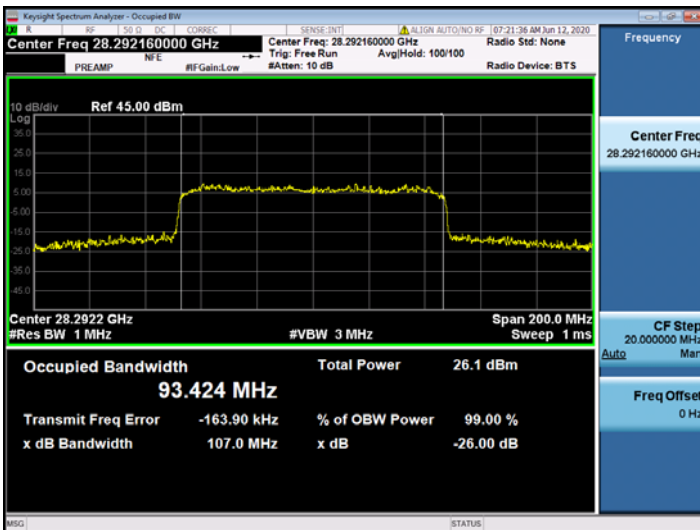
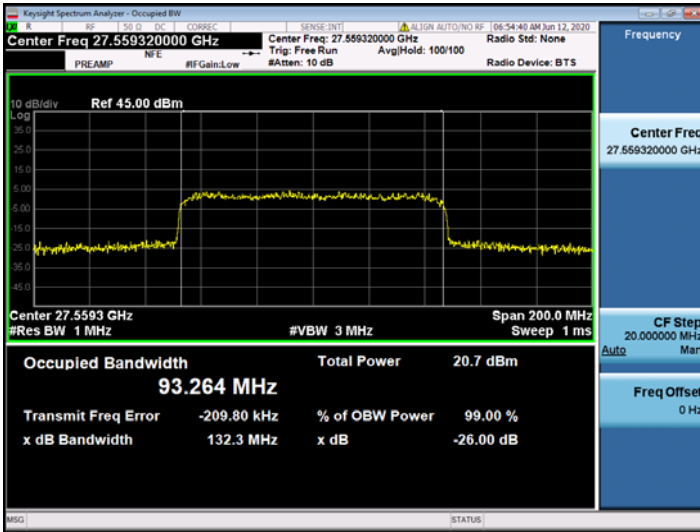
Plot Data of RF Occupied Bandwidth

1. Antenna 0(L patch), n261

50 MHz, 1CC

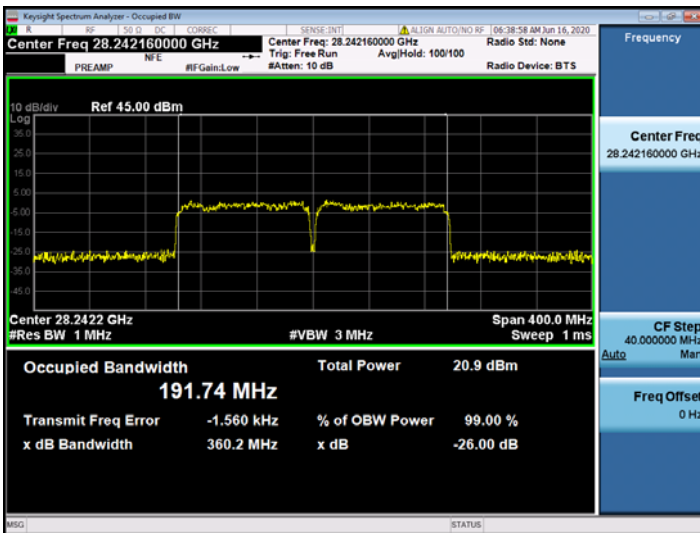
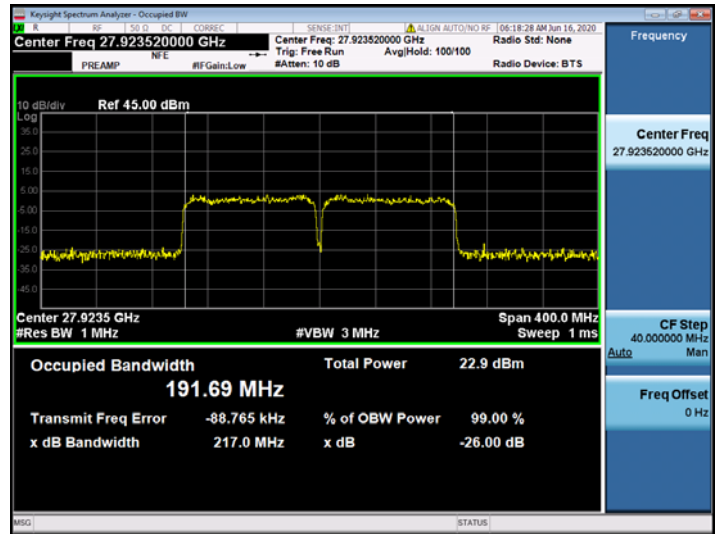
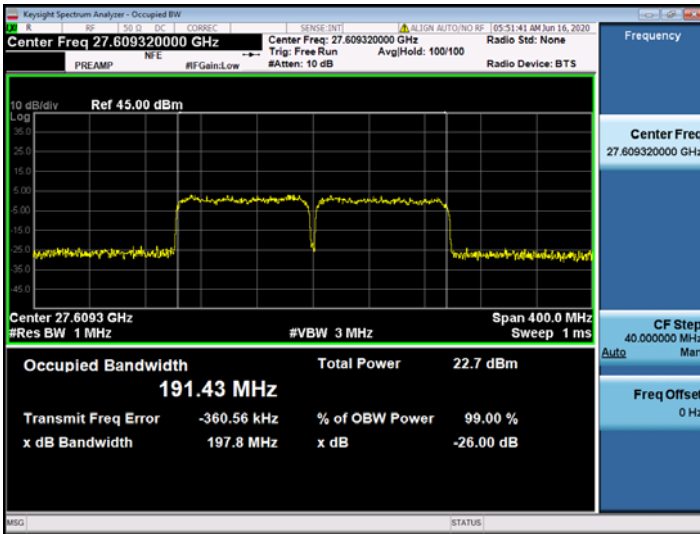


100 MHz, 1CC



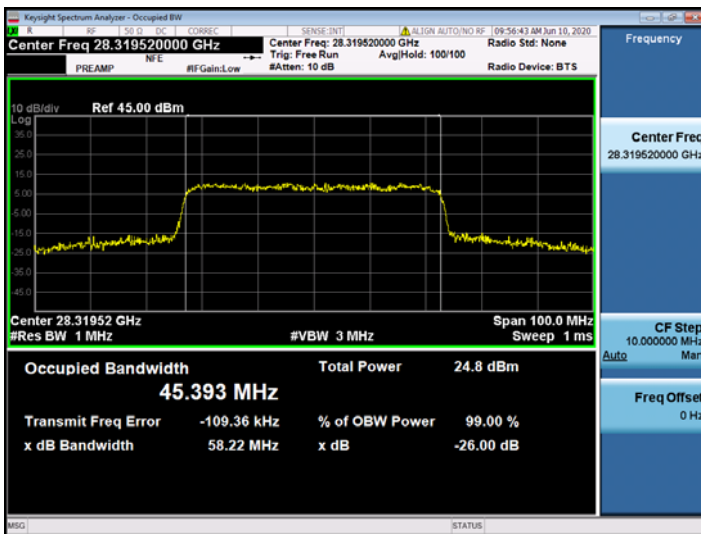
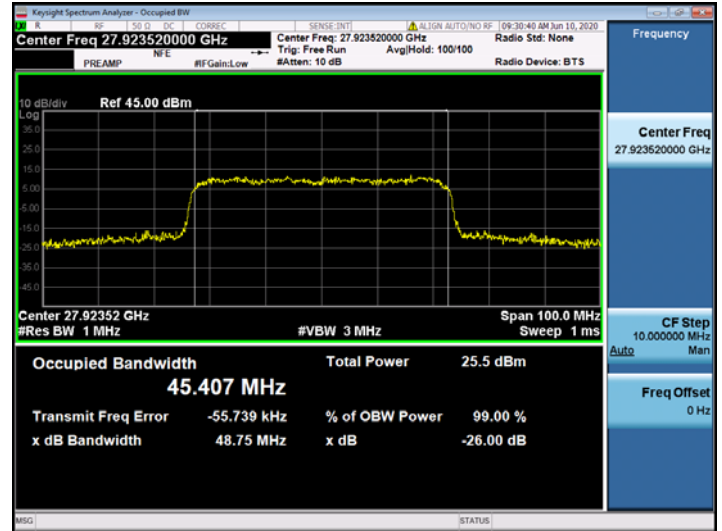
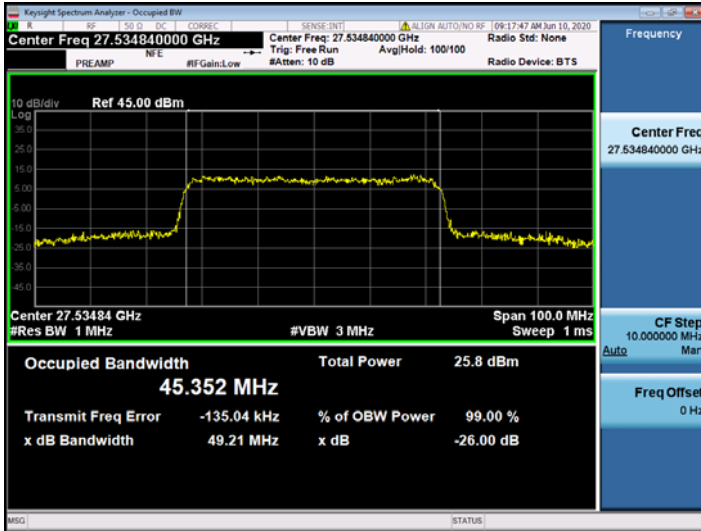


100 MHz, 2CC

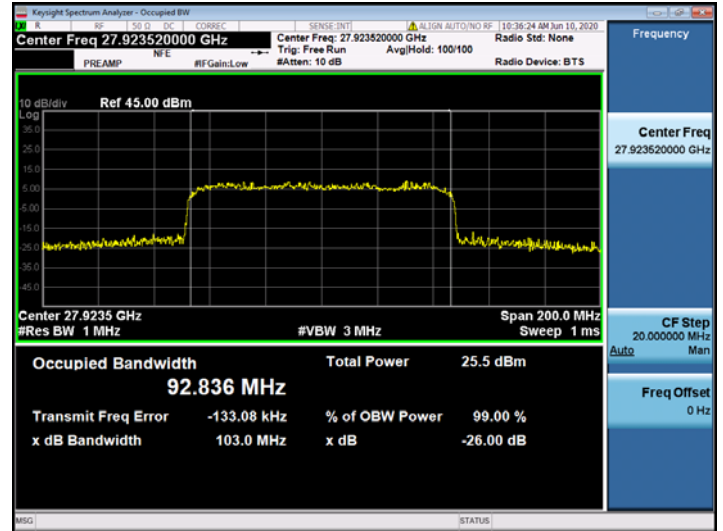
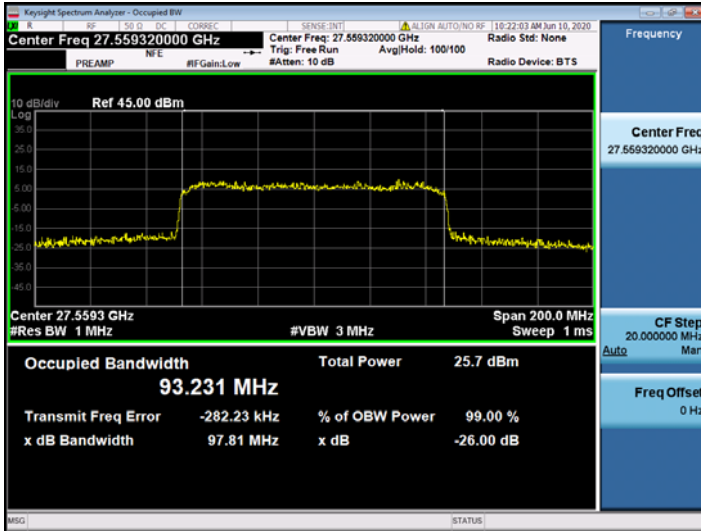


2. Antenna 1(K patch), n261

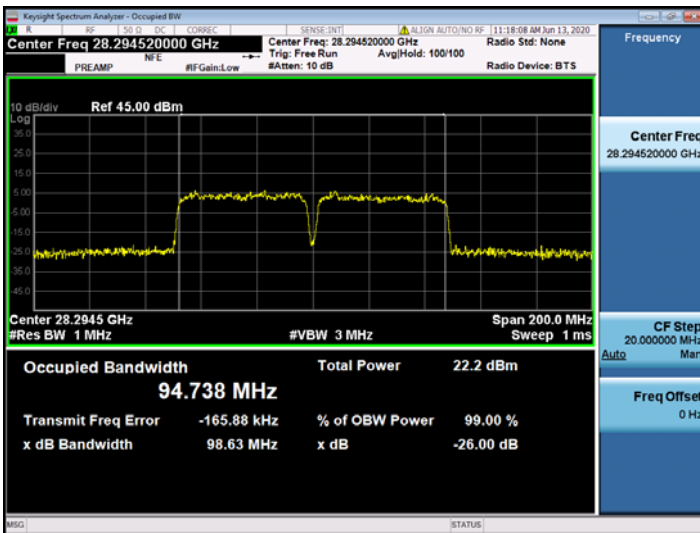
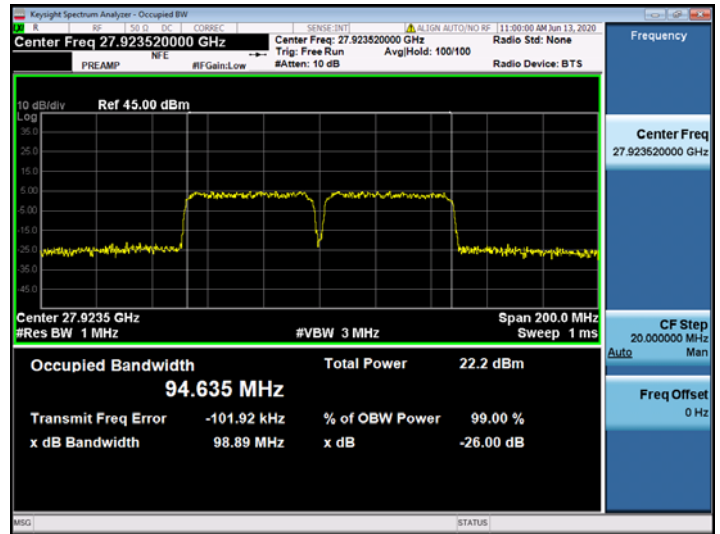
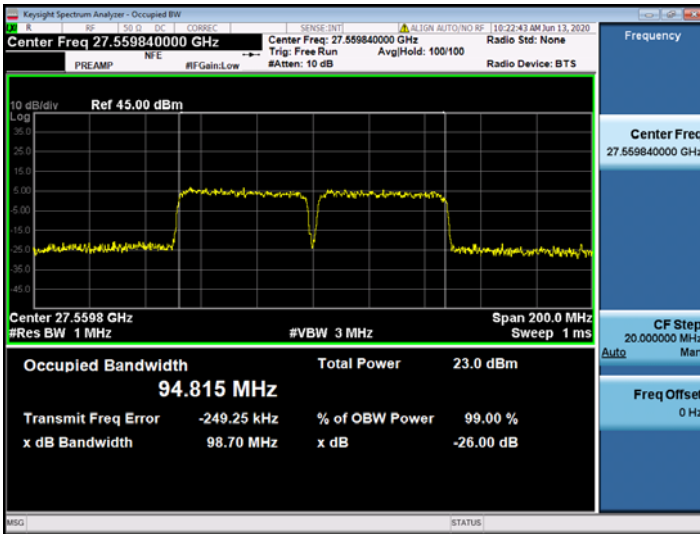
50 MHz, 1CC



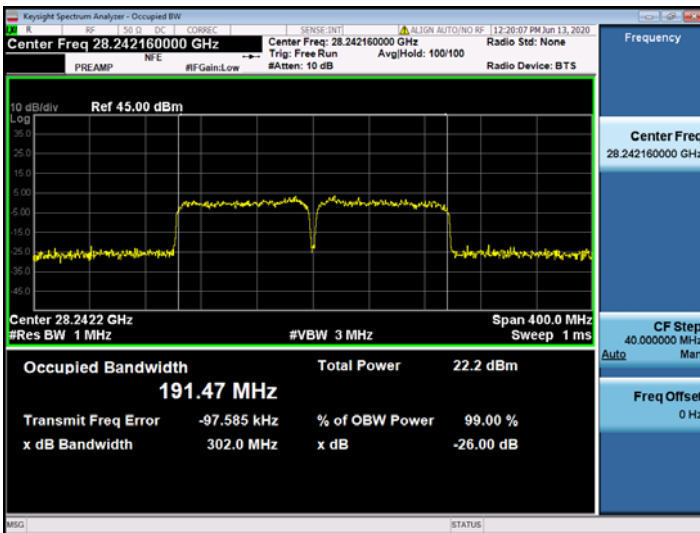
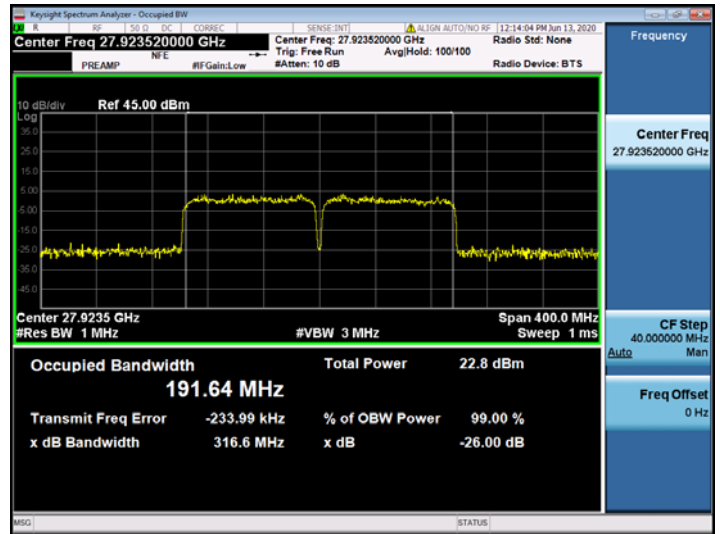
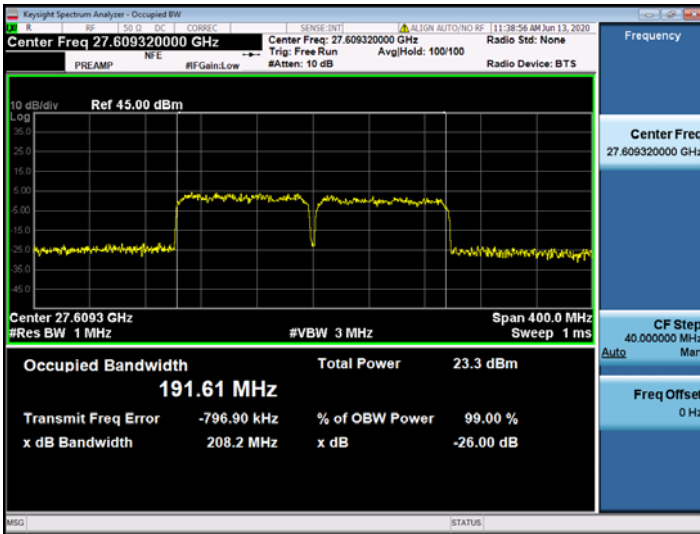
100 MHz, 1CC



50 MHz, 2CC

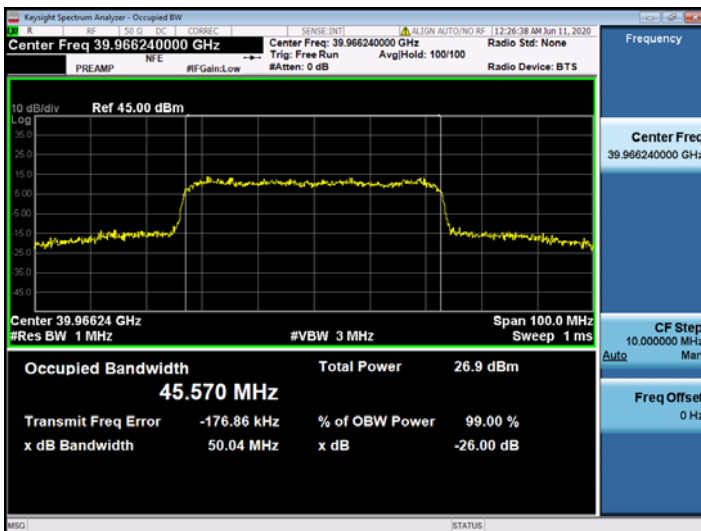
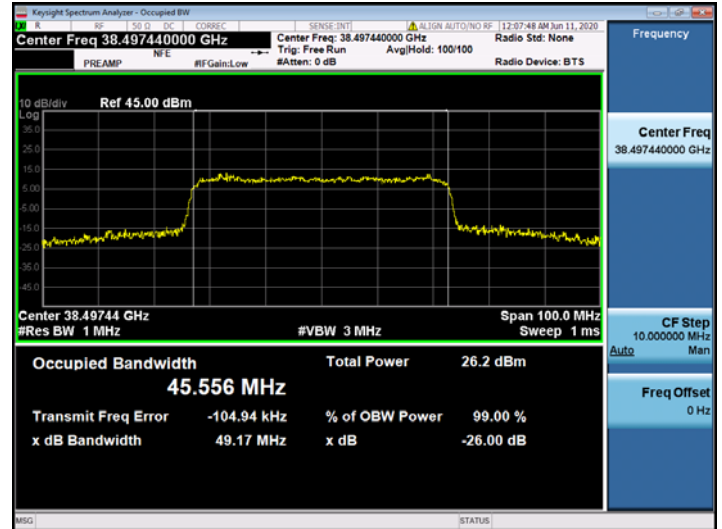
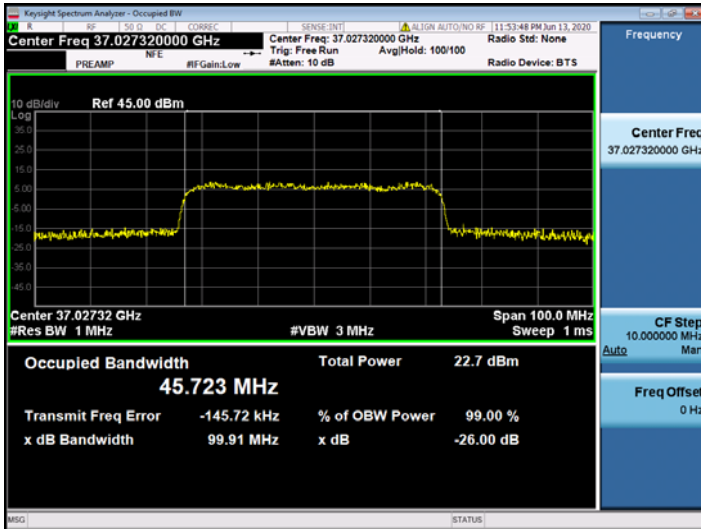


100 MHz, 2CC

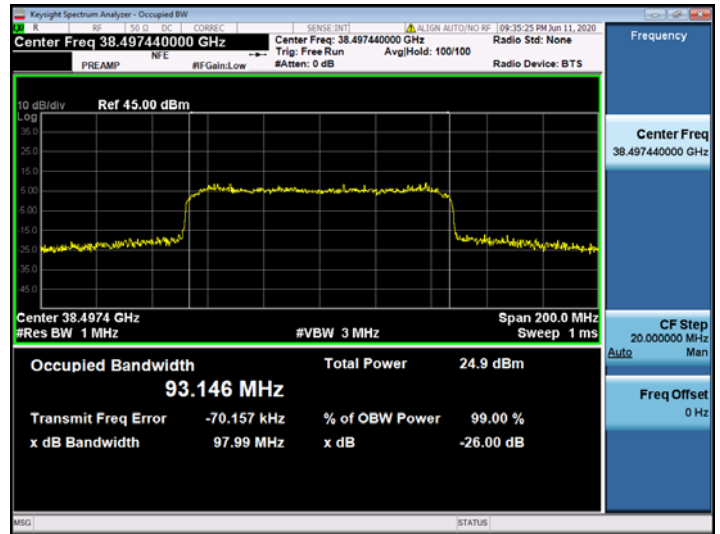
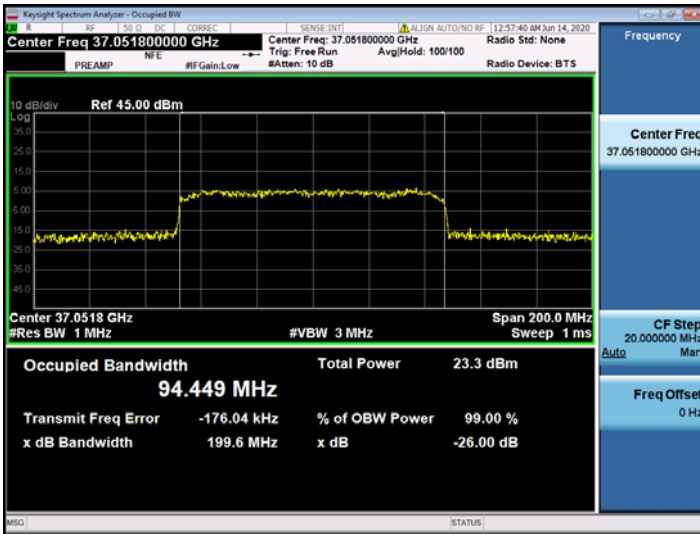


3. Antenna 0(L patch), n260

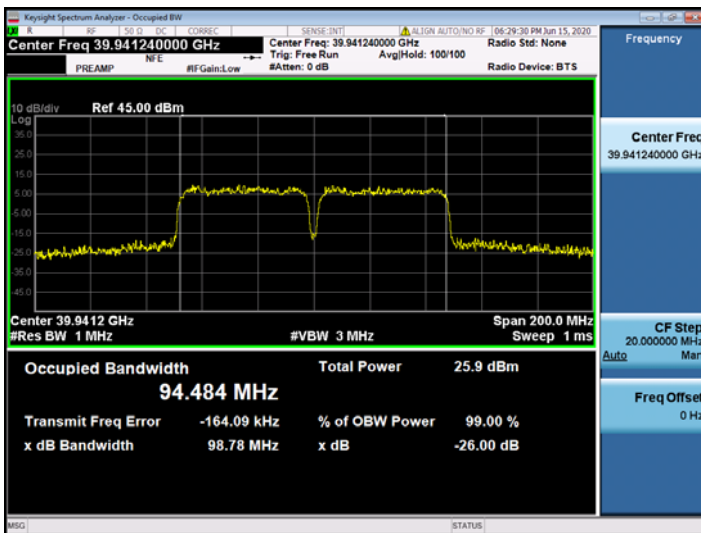
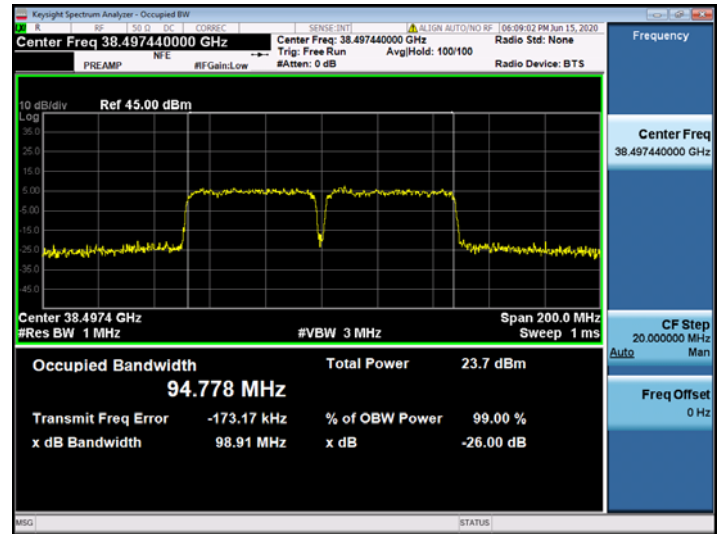
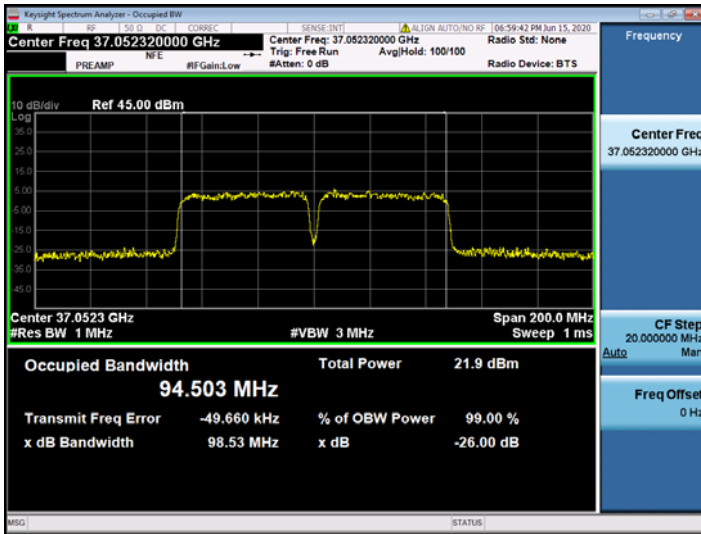
50 MHz, 1CC



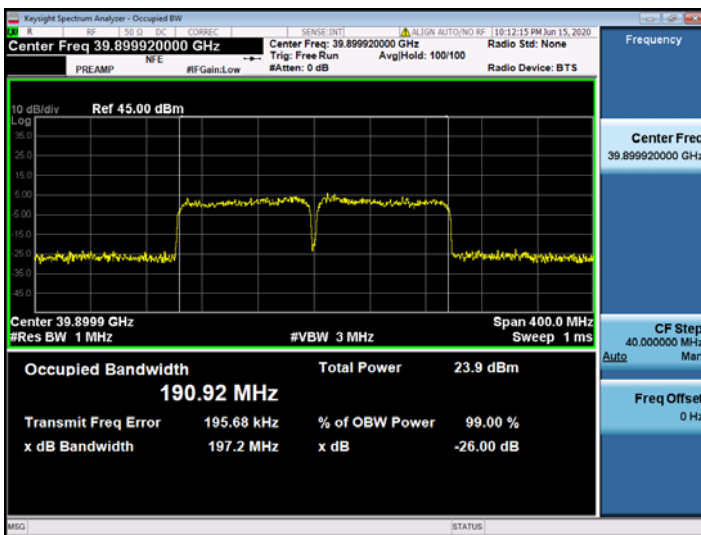
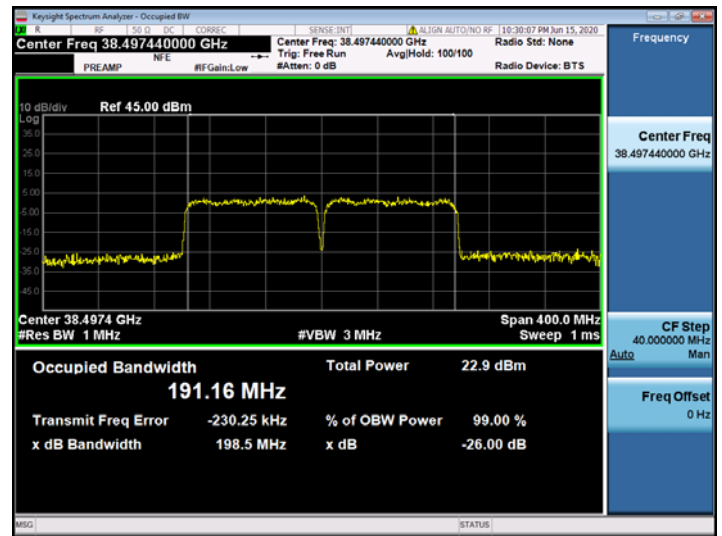
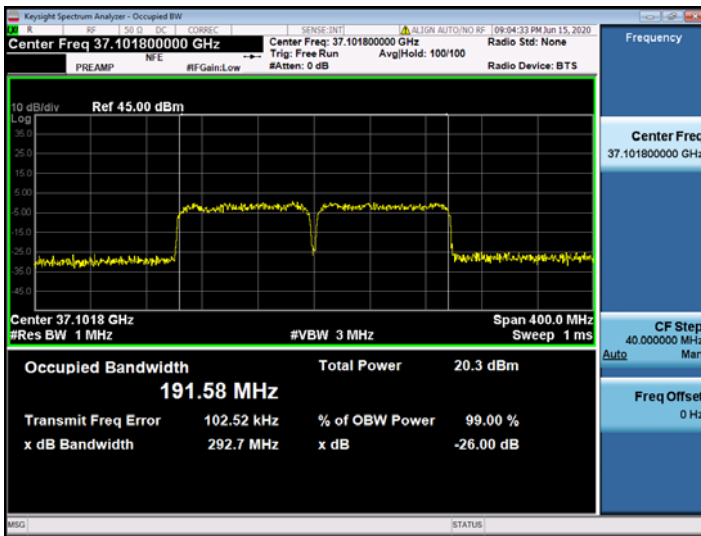
100 MHz, 1CC



50 MHz, 2CC

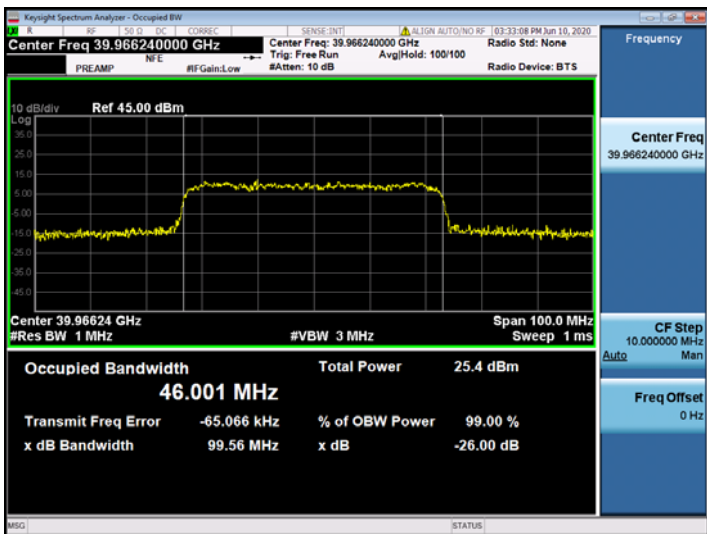
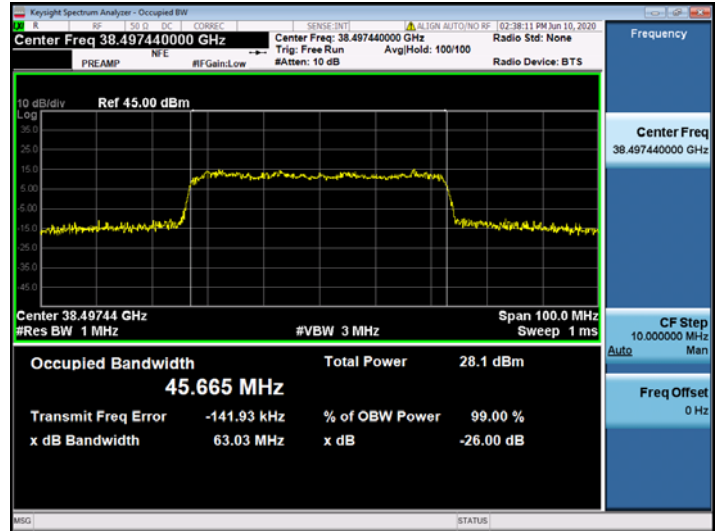
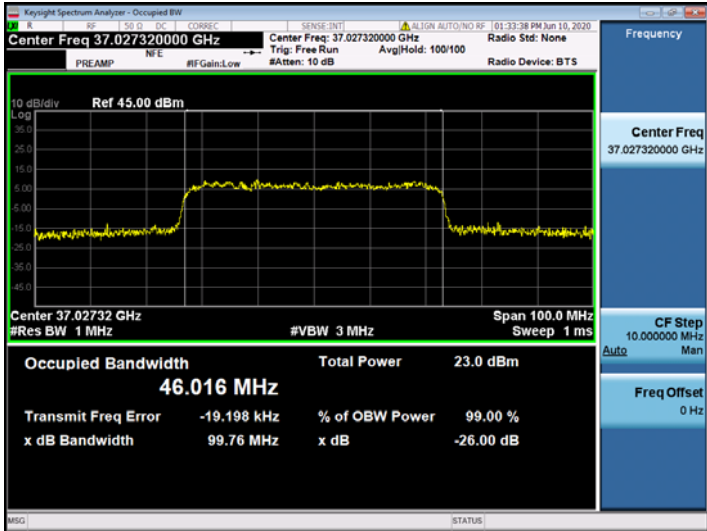


100 MHz, 2CC

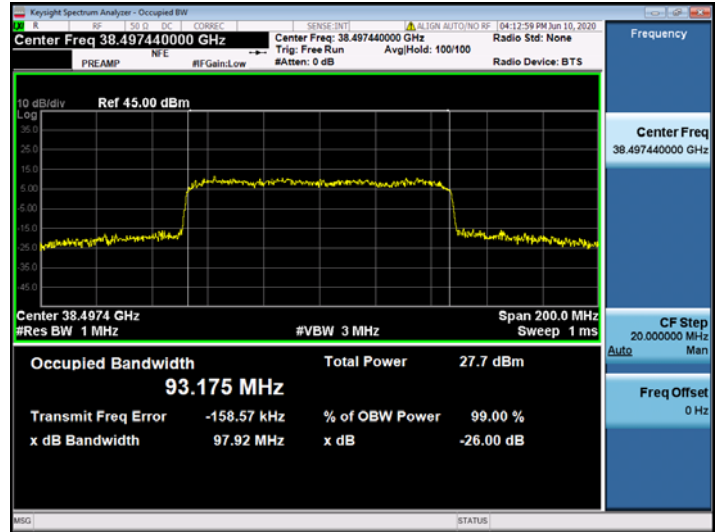
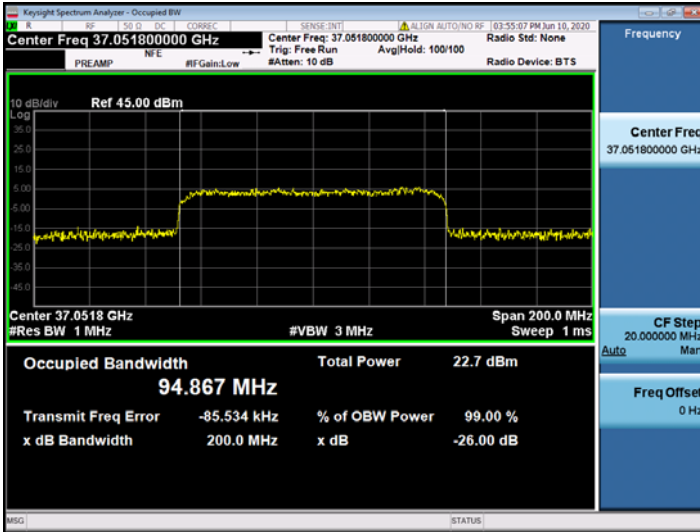


4. Antenna 1(K patch), n260

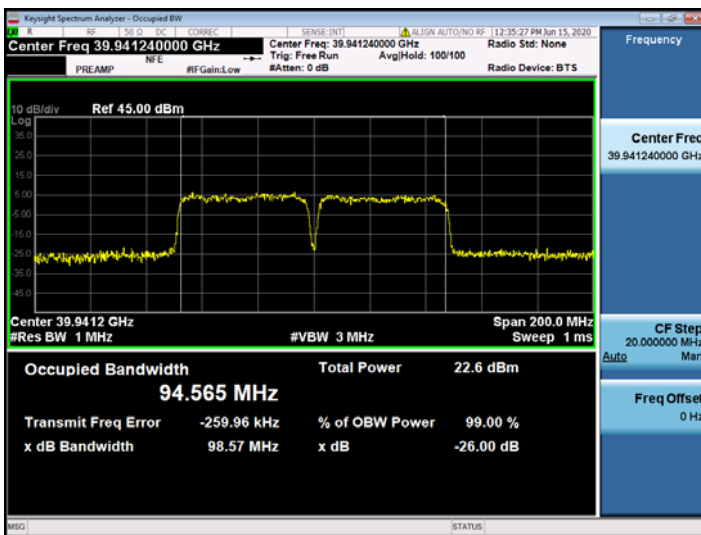
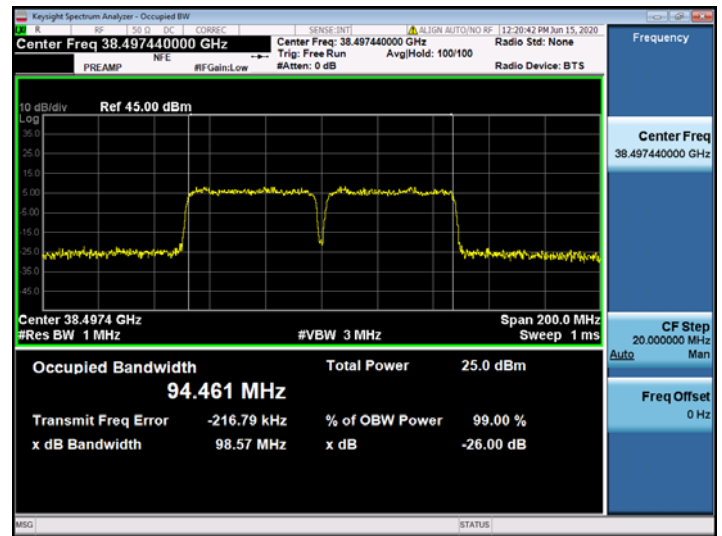
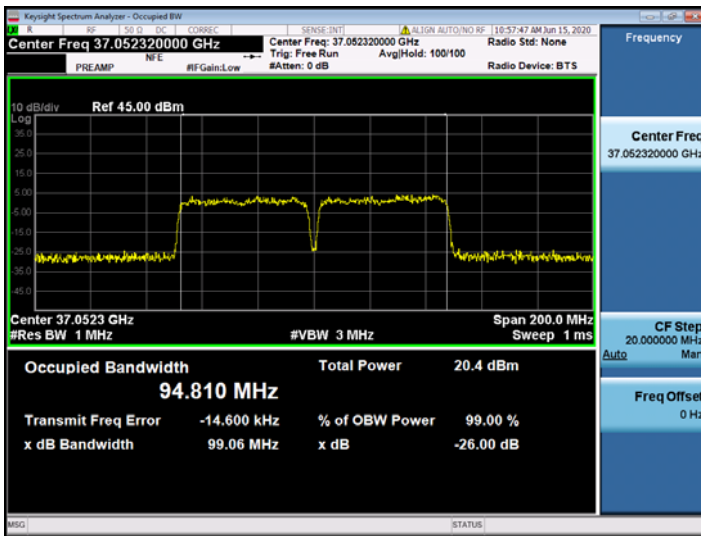
50 MHz, 1CC



100 MHz, 1CC



50 MHz, 2CC



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 $2 \times$ to $3 \times$ the OBW.
- b) Set RBW = 1% to 5% of the OBW.
- c) Set VBW $\geq 3 \times$ RBW.
- d) Set number of measurement points in sweep $\geq 2 \times$ span / RBW.
- e) Sweep time:
 - 1) Set = auto-couple, or
 - 2) Set $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})]$ 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 $10 \log (1/\text{duty cycle})$ 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:
Antenna 0(L patch), n261
SISO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol [H/V]	RB Size/Offset	EIRP [dBm]
1	50 MHz	27534.84	Low	H	QPSK	H	1/0	20.61
		27534.84	Low	V	QPSK	H	1/0	21.02
		27923.52	Mid	H	BPSK	H	16/0	20.26
		27923.52	Mid	V	QPSK	V	1/31	21.28
		28319.52	High	H	BPSK	H	16/16	19.10
		28319.52	High	V	QPSK	V	1/31	20.55
	100 MHz	27559.32	Low	H	BPSK	H	1/63	20.72
		27559.32	Low	V	QPSK	H	1/0	20.58
		27923.52	Mid	H	QPSK	H	1/0	20.00
		27923.52	Mid	V	QPSK	V	1/63	20.91
		28292.16	High	H	BPSK	H	1/63	19.70
		28292.16	High	V	QPSK	V	1/63	20.83
2	50 MHz	27559.84	Low	H	16QAM	H	32/0	18.48
		27559.84	Low	V	BPSK	H	32/0	18.49
		27923.52	Mid	H	QPSK	H	32/0	18.18
		27923.52	Mid	V	BPSK	H	32/0	17.57
		28294.52	High	H	QPSK	H	32/0	16.40
		28294.52	High	V	BPSK	H	32/0	17.68
	100 MHz	27609.32	Low	H	16QAM	H	32/32	18.39
		27609.32	Low	V	BPSK	H	64/0	18.60
		27923.52	Mid	H	QPSK	H	32/0	18.47
		27923.52	Mid	V	BPSK	H	64/0	17.75
		28242.16	High	H	BPSK	H	32/32	17.25
		28242.16	High	V	BPSK	H	32/32	18.24

MIMO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol [H/V]	RB Size/Offset	EIRP [dBm]	SUM [dBm]
1	50 MHz	27534.84	Low	MIMO	QPSK	H	1/0	20.74	22.10
		27534.84	Low	MIMO	QPSK	V		16.40	
		27923.52	Mid	MIMO	QPSK	H	1/16	20.64	22.11
		27923.52	Mid	MIMO	QPSK	V		16.69	
		28319.52	High	MIMO	QPSK	H	1/16	20.59	24.62
		28319.52	High	MIMO	QPSK	V		22.43	
	100 MHz	27559.32	Low	MIMO	QPSK	H	1/0	21.30	22.54
		27559.32	Low	MIMO	QPSK	V		16.51	
		27923.52	Mid	MIMO	QPSK	H	1/33	20.91	22.74
		27923.52	Mid	MIMO	QPSK	V		18.11	
		28292.16	High	MIMO	QPSK	H	1/33	21.41	24.24
		28292.16	High	MIMO	QPSK	V		21.05	
2	50 MHz	27559.84	Low	MIMO	QPSK	H	16/0	18.41	19.61
		27559.84	Low	MIMO	QPSK	V		13.42	
		27923.52	Mid	MIMO	QPSK	H	32/0	17.60	19.49
		27923.52	Mid	MIMO	QPSK	V		14.96	
		28294.52	High	MIMO	QPSK	H	32/0	17.26	21.01
		28294.52	High	MIMO	QPSK	V		18.64	
	100 MHz	27609.32	Low	MIMO	QPSK	H	33/33	17.48	18.82
		27609.32	Low	MIMO	QPSK	V		13.06	
		27923.52	Mid	MIMO	QPSK	H	66/0	17.51	19.24
		27923.52	Mid	MIMO	QPSK	V		14.42	
		28242.16	High	MIMO	QPSK	H	33/33	15.66	20.16
		28242.16	High	MIMO	QPSK	V		18.26	

Antenna 1(K patch), n261
SISO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol [H/V]	RB Size/Offset	EIRP [dBm]
1	50 MHz	27534.84	Low	H	BPSK	V	1/0	25.05
		27534.84	Low	V	BPSK	V	1/0	23.60
		27923.52	Mid	H	BPSK	V	1/31	24.36
		27923.52	Mid	V	BPSK	V	1/31	23.47
		28319.52	High	H	BPSK	H	1/16	23.28
		28319.52	High	V	BPSK	H	1/31	23.17
	100 MHz	27559.32	Low	H	BPSK	V	1/32	24.59
		27559.32	Low	V	BPSK	V	1/0	23.39
		27923.52	Mid	H	BPSK	V	1/63	24.38
		27923.52	Mid	V	BPSK	V	1/63	23.24
		28292.16	High	H	BPSK	H	1/63	23.46
		28292.16	High	V	BPSK	H	1/32	23.09
2	50 MHz	27559.84	Low	H	BPSK	V	32/0	22.21
		27559.84	Low	V	BPSK	V	32/0	21.00
		27923.52	Mid	H	BPSK	V	32/0	22.29
		27923.52	Mid	V	BPSK	V	32/0	21.19
		28294.52	High	H	BPSK	H	32/0	21.33
		28294.52	High	V	BPSK	H	32/0	21.19
	100 MHz	27609.32	Low	H	BPSK	V	64/0	22.09
		27609.32	Low	V	BPSK	V	64/0	20.83
		27923.52	Mid	H	BPSK	V	64/0	22.32
		27923.52	Mid	V	BPSK	V	64/0	20.93
		28242.16	High	H	BPSK	H	64/0	20.93
		28242.16	High	V	BPSK	H	64/0	20.72

MIMO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol [H/V]	RB Size/Offset	EIRP [dBm]	SUM [dBm]
1	50 MHz	27534.84	Low	MIMO	QPSK	H	1/0	23.97	25.75
		27534.84	Low	MIMO	QPSK	V		21.03	
		27923.52	Mid	MIMO	QPSK	H	1/16	21.18	24.14
		27923.52	Mid	MIMO	QPSK	V		21.07	
		28319.52	High	MIMO	QPSK	H	1/16	21.91	24.38
		28319.52	High	MIMO	QPSK	V		20.76	
	100 MHz	27559.32	Low	MIMO	QPSK	H	1/65	24.14	25.94
		27559.32	Low	MIMO	QPSK	V		21.24	
		27923.52	Mid	MIMO	QPSK	H	1/33	21.48	24.25
		27923.52	Mid	MIMO	QPSK	V		20.99	
		28292.16	High	MIMO	QPSK	H	1/33	21.04	24.18
		28292.16	High	MIMO	QPSK	V		21.30	
2	50 MHz	27559.84	Low	MIMO	QPSK	H	32/0	21.16	22.79
		27559.84	Low	MIMO	QPSK	V		17.73	
		27923.52	Mid	MIMO	QPSK	H	32/0	20.86	22.34
		27923.52	Mid	MIMO	QPSK	V		16.93	
		28294.52	High	MIMO	QPSK	H	32/0	19.68	21.52
		28294.52	High	MIMO	QPSK	V		16.91	
	100 MHz	27609.32	Low	MIMO	QPSK	H	66/0	21.23	22.90
		27609.32	Low	MIMO	QPSK	V		17.93	
		27923.52	Mid	MIMO	QPSK	H	66/0	20.88	22.47
		27923.52	Mid	MIMO	QPSK	V		17.35	
		28242.16	High	MIMO	QPSK	H	66/0	19.40	21.30
		28242.16	High	MIMO	QPSK	V		16.79	

Antenna 0(L patch), n260
SISO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol [H/V]	RB Size/Offset	EIRP [dBm]
1	50 MHz	37027.32	Low	H	BPSK	H	1/31	18.72
		37027.32	Low	V	BPSK	H	1/31	20.53
		38497.44	Mid	H	BPSK	H	32/0	21.54
		38497.44	Mid	V	BPSK	H	1/0	22.37
		39966.24	High	H	BPSK	H	1/31	20.61
		39966.24	High	V	BPSK	H	32/0	21.28
	100 MHz	37051.80	Low	H	BPSK	V	1/0	17.53
		37051.80	Low	V	BPSK	H	1/32	19.96
		38497.44	Mid	H	BPSK	V	64/0	20.01
		38497.44	Mid	V	BPSK	H	1/0	22.27
		39949.92	High	H	BPSK	V	64/0	22.00
		39949.92	High	V	BPSK	V	54/0	21.52
2	50 MHz	37052.32	Low	H	BPSK	V	32/0	15.94
		37052.32	Low	V	BPSK	H	32/0	17.89
		38497.44	Mid	H	BPSK	V	32/0	17.81
		38497.44	Mid	V	BPSK	H	32/0	19.31
		39941.24	High	H	BPSK	V	32/0	20.29
		39941.24	High	V	BPSK	H	32/0	20.08
	100 MHz	37101.80	Low	H	BPSK	V	64/0	15.56
		37101.80	Low	V	QPSK	H	32/32	17.91
		38497.44	Mid	H	BPSK	V	64/0	17.80
		38497.44	Mid	V	QPSK	H	64/0	19.72
		39899.92	High	H	BPSK	V	64/0	19.87
		39899.92	High	V	QPSK	V	64/0	19.49

MIMO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol [H/V]	RB Size/Offset	EIRP [dBm]	SUM [dBm]
1	50 MHz	37027.32	Low	MIMO	QPSK	H	1/16	18.37	21.01
		37027.32	Low	MIMO	QPSK	V		17.60	
		38497.44	Mid	MIMO	QPSK	H	1/16	21.93	23.92
		38497.44	Mid	MIMO	QPSK	V		19.56	
		39966.24	High	MIMO	QPSK	H	1/16	23.38	25.59
		39966.24	High	MIMO	QPSK	V		21.60	
	100 MHz	37051.80	Low	MIMO	QPSK	H	1/33	20.17	22.38
		37051.80	Low	MIMO	QPSK	V		18.39	
		38497.44	Mid	MIMO	QPSK	H	1/33	20.44	22.96
		38497.44	Mid	MIMO	QPSK	V		19.39	
		39949.92	High	MIMO	QPSK	H	1/33	22.83	25.40
		39949.92	High	MIMO	QPSK	V		21.90	
2	50 MHz	37052.32	Low	MIMO	QPSK	H	32/0	16.71	19.17
		37052.32	Low	MIMO	QPSK	V		15.52	
		38497.44	Mid	MIMO	QPSK	H	32/0	18.38	20.88
		38497.44	Mid	MIMO	QPSK	V		17.29	
		39941.24	High	MIMO	QPSK	H	32/0	20.45	22.77
		39941.24	High	MIMO	QPSK	V		18.94	
	100 MHz	37101.80	Low	MIMO	QPSK	H	66/0	15.10	17.85
		37101.80	Low	MIMO	QPSK	V		14.57	
		38497.44	Mid	MIMO	QPSK	H	66/0	17.57	19.92
		38497.44	Mid	MIMO	QPSK	V		16.14	
		39899.92	High	MIMO	QPSK	H	66/0	18.49	20.69
		39899.92	High	MIMO	QPSK	V		16.69	

Antenna 1(K patch), n260
SISO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol [H/V]	RB Size/Offset	EIRP [dBm]
1	50 MHz	37027.32	Low	H	BPSK	V	1/0	19.33
		37027.32	Low	V	BPSK	V	1/0	19.65
		38497.44	Mid	H	BPSK	V	1/31	21.89
		38497.44	Mid	V	BPSK	V	1/31	20.39
		39966.24	High	H	BPSK	V	1/31	20.20
		39966.24	High	V	BPSK	V	1/31	19.45
	100 MHz	37051.80	Low	H	BPSK	V	1/0	19.42
		37051.80	Low	V	BPSK	V	1/0	19.81
		38497.44	Mid	H	BPSK	V	1/0	21.25
		38497.44	Mid	V	BPSK	V	1/63	20.90
		39949.92	High	H	BPSK	V	1/63	20.22
		39949.92	High	V	BPSK	V	1/0	19.60
2	50 MHz	37052.32	Low	H	BPSK	V	32/0	17.49
		37052.32	Low	V	BPSK	V	32/0	17.45
		38497.44	Mid	H	BPSK	V	32/0	19.80
		38497.44	Mid	V	BPSK	V	32/0	18.27
		39941.24	High	H	BPSK	V	32/0	18.08
		39941.24	High	V	BPSK	V	32/0	16.52
	100 MHz	37101.80	Low	H	BPSK	V	64/0	17.32
		37101.80	Low	V	BPSK	V	64/0	17.33
		38497.44	Mid	H	BPSK	V	64/0	19.52
		38497.44	Mid	V	BPSK	V	64/0	18.43
		39899.92	High	H	BPSK	V	64/0	17.65
		39899.92	High	V	BPSK	V	64/0	16.55

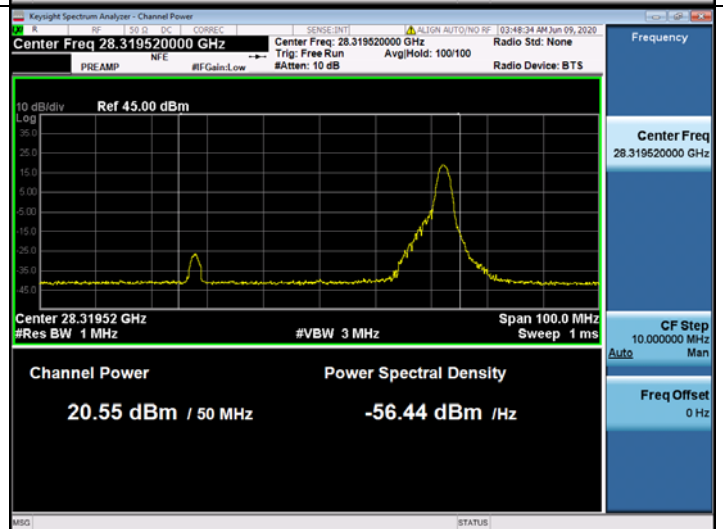
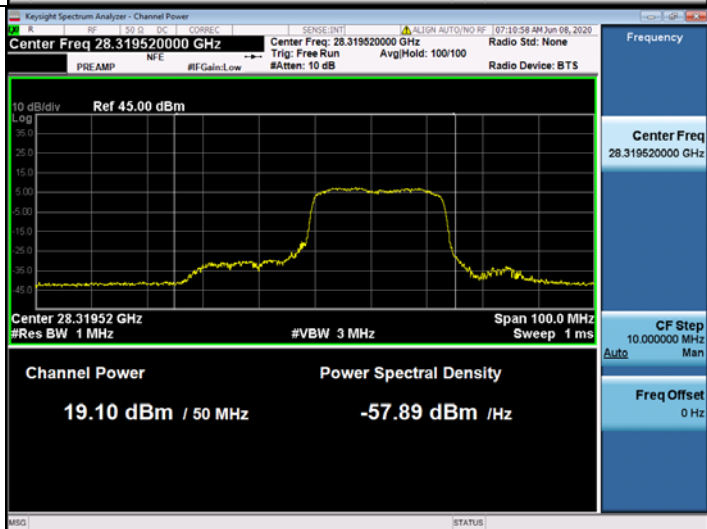
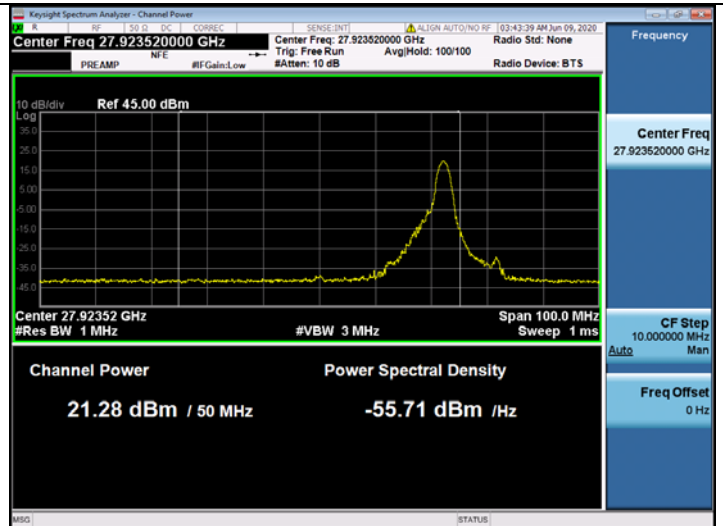
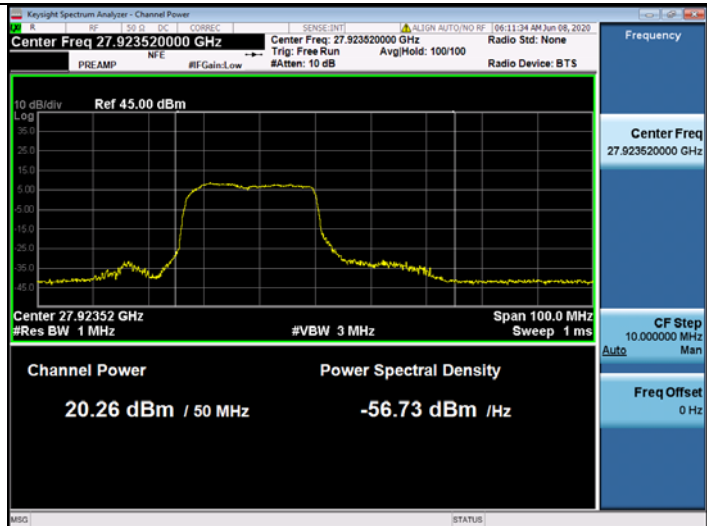
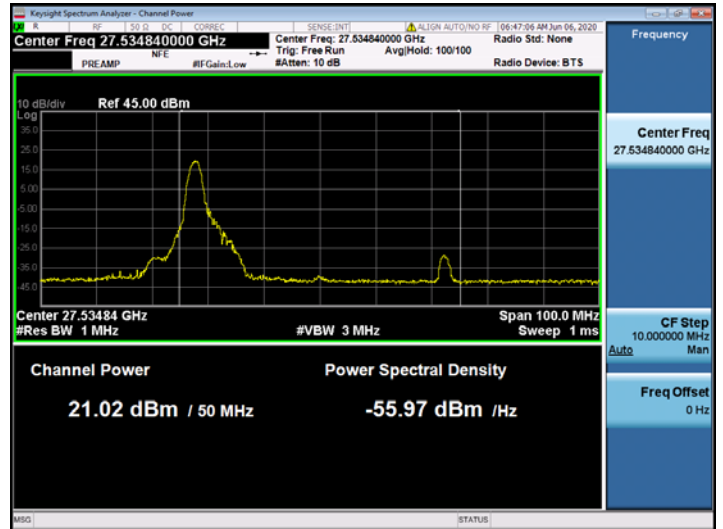
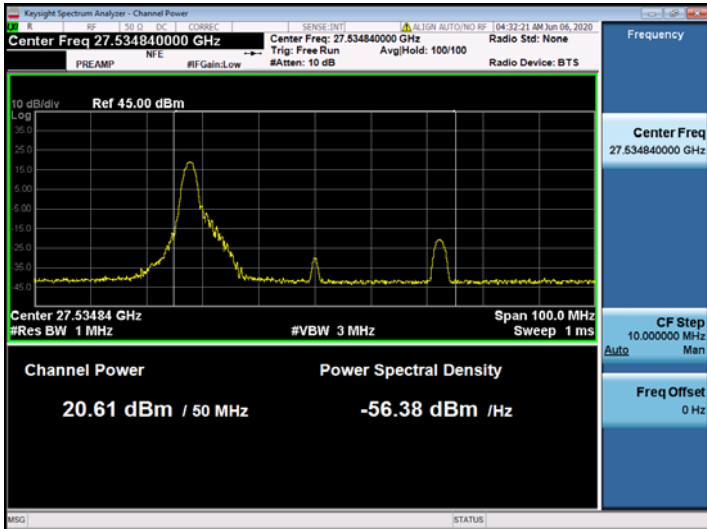
MIMO

CCs active	BW	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol [H/V]	RB Size/Offset	EIRP [dBm]	SUM [dBm]
1	50 MHz	37027.32	Low	MIMO	QPSK	H	1/16	18.02	20.91
		37027.32	Low	MIMO	QPSK	V		17.78	
		38497.44	Mid	MIMO	QPSK	H	1/16	17.15	24.49
		38497.44	Mid	MIMO	QPSK	V		23.61	
		39966.24	High	MIMO	QPSK	H	1/16	20.75	24.19
		39966.24	High	MIMO	QPSK	V		21.57	
	100 MHz	37051.80	Low	MIMO	QPSK	H	1/33	18.24	21.40
		37051.80	Low	MIMO	QPSK	V		18.53	
		38497.44	Mid	MIMO	QPSK	H	1/33	17.05	23.86
		38497.44	Mid	MIMO	QPSK	V		22.85	
		39949.92	High	MIMO	QPSK	H	1/33	20.61	24.20
		39949.92	High	MIMO	QPSK	V		21.70	
2	50 MHz	37052.32	Low	MIMO	QPSK	H	32/0	14.47	17.84
		37052.32	Low	MIMO	QPSK	V		15.17	
		38497.44	Mid	MIMO	QPSK	H	32/0	13.81	20.66
		38497.44	Mid	MIMO	QPSK	V		19.65	
		39941.24	High	MIMO	QPSK	H	32/0	16.79	20.03
		39941.24	High	MIMO	QPSK	V		17.23	
	100 MHz	37101.80	Low	MIMO	QPSK	H	66/0	14.57	18.06
		37101.80	Low	MIMO	QPSK	V		15.49	
		38497.44	Mid	MIMO	QPSK	H	66/0	13.74	21.05
		38497.44	Mid	MIMO	QPSK	V		20.16	
		39899.92	High	MIMO	QPSK	H	66/0	16.49	19.81
		39899.92	High	MIMO	QPSK	V		17.08	

Plot Data of EIRP

1. Antenna 0(Lpatch), n261

50 MHz, 1CC SISO



100 MHz, 1CC SISO

