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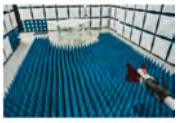

MEASUREMENT REPORT
FCC Part 30 5G mmWave

Applicant Name:
Samsung Electronics Co., Ltd.
129, Samsung-ro,
Yeongtong-gu, Suwon-si
Gyeonggi-do, 16677, Korea

Date of Testing:
10/11 - 12/06/2019
Test Site/Location:
PCTEST Lab. Columbia, MD, USA
Test Report Serial No.:
1M1910220166-06-R1.A3L

FCC ID:	**A3LSMG986U**
APPLICANT:	**Samsung Electronics Co., Ltd.**

Application Type:	Certification
Model:	SM-G986U
Additional Model(s):	SM-G986U1, SM-G986XU
EUT Type:	Portable Handset
FCC Classification:	Part 30 Mobile Transmitter (5GM)
FCC Rule Part(s):	30
Test Procedure(s):	ANSI C63.26-2015, KDB 971168 D01 v03r01, KDB 842590 D01 v01

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

This revised Test Report (S/N: 1M1910220166-06-R1.A3L) supersedes and replaces the previously issued test report (S/N: 1M1910220166-06.A3L) on the same subject device for the same type of testing as indicated. Please discard or destroy the previously issued test report(s) and dispose of it accordingly.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Randy Ortanez
President

ACCREDITED
TESTING CERT#2041.01

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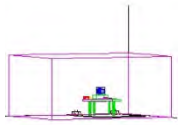
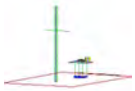


MEASUREMENT REPORT
FCC Part 30



Band	FCC Rule Part	Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
							Max. Power (W)	Max. Power (dBm)		
n261	30	SISO	Ant1	50	1	27500 - 28350	0.220	23.42	45M7G7D	QPSK
n261	30	SISO	Ant1	50	1	27500 - 28350	0.145	21.61	45M3W7D	16QAM
n261	30	SISO	Ant1	50	1	27500 - 28350	0.081	19.09	45M2W7D	64QAM
n261	30	MIMO	Ant1	50	1	27500 - 28350	0.159	22.00	45M7G7D	QPSK
n261	30	MIMO	Ant1	50	1	27500 - 28350	0.149	21.72	45M3W7D	16QAM
n261	30	MIMO	Ant1	50	1	27500 - 28350	0.081	19.07	45M2W7D	64QAM
n261	30	SISO	Ant1	50	2	27500 - 28350	0.144	21.58	94M9G7D	QPSK
n261	30	SISO	Ant1	50	2	27500 - 28350	0.105	20.20	94M6W7D	16QAM
n261	30	SISO	Ant1	50	2	27500 - 28350	0.061	17.85	94M4W7D	64QAM
n261	30	MIMO	Ant1	50	2	27500 - 28350	0.141	21.50	94M9G7D	QPSK
n261	30	MIMO	Ant1	50	2	27500 - 28350	0.085	19.28	94M6W7D	16QAM
n261	30	MIMO	Ant1	50	2	27500 - 28350	0.054	17.33	94M4W7D	64QAM
n261	30	SISO	Ant1	100	1	27500 - 28350	0.238	23.77	90M7G7D	QPSK
n261	30	SISO	Ant1	100	1	27500 - 28350	0.155	21.91	90M5W7D	16QAM
n261	30	SISO	Ant1	100	1	27500 - 28350	0.081	19.06	90M8W7D	64QAM
n261	30	MIMO	Ant1	100	1	27500 - 28350	0.232	23.65	90M7G7D	QPSK
n261	30	MIMO	Ant1	100	1	27500 - 28350	0.118	20.73	90M5W7D	16QAM
n261	30	MIMO	Ant1	100	1	27500 - 28350	0.063	18.00	90M8W7D	64QAM
n261	30	SISO	Ant1	100	2	27500 - 28350	0.224	23.51	189MG7D	QPSK
n261	30	SISO	Ant1	100	2	27500 - 28350	0.167	22.24	189MW7D	16QAM
n261	30	SISO	Ant1	100	2	27500 - 28350	0.106	20.25	190MW7D	64QAM
n261	30	MIMO	Ant1	100	2	27500 - 28350	0.127	21.03	189MG7D	QPSK
n261	30	MIMO	Ant1	100	2	27500 - 28350	0.091	19.57	189MW7D	16QAM
n261	30	MIMO	Ant1	100	2	27500 - 28350	0.066	18.19	190MW7D	64QAM

EUT Overview (J Patch / Ant1 - Band n261)

Band	FCC Rule Part	Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
							Max. Power (W)	Max. Power (dBm)		
n261	30	SISO	Ant2	50	1	27500 - 28350	0.067	18.23	48M3G7D	QPSK
n261	30	SISO	Ant2	50	1	27500 - 28350	0.041	16.09	48M5W7D	16QAM
n261	30	SISO	Ant2	50	1	27500 - 28350	0.031	14.95	48M1W7D	64QAM
n261	30	MIMO	Ant2	50	1	27500 - 28350	0.064	18.03	48M3G7D	QPSK
n261	30	MIMO	Ant2	50	1	27500 - 28350	0.034	15.26	48M5W7D	16QAM
n261	30	MIMO	Ant2	50	1	27500 - 28350	0.023	13.70	48M1W7D	64QAM
n261	30	SISO	Ant2	50	2	27500 - 28350	0.057	17.56	94M9G7D	QPSK
n261	30	SISO	Ant2	50	2	27500 - 28350	0.037	15.72	94M6W7D	16QAM
n261	30	SISO	Ant2	50	2	27500 - 28350	0.024	13.77	95M0W7D	64QAM
n261	30	MIMO	Ant2	50	2	27500 - 28350	0.053	17.25	94M9G7D	QPSK
n261	30	MIMO	Ant2	50	2	27500 - 28350	0.027	14.34	94M6W7D	16QAM
n261	30	MIMO	Ant2	50	2	27500 - 28350	0.020	13.02	95M0W7D	64QAM
n261	30	SISO	Ant2	100	1	27500 - 28350	0.079	18.95	90M4G7D	QPSK
n261	30	SISO	Ant2	100	1	27500 - 28350	0.053	17.22	90M5W7D	16QAM
n261	30	SISO	Ant2	100	1	27500 - 28350	0.045	16.55	90M2W7D	64QAM
n261	30	MIMO	Ant2	100	1	27500 - 28350	0.065	18.11	90M4G7D	QPSK
n261	30	MIMO	Ant2	100	1	27500 - 28350	0.033	15.20	90M5W7D	16QAM
n261	30	MIMO	Ant2	100	1	27500 - 28350	0.020	12.95	90M2W7D	64QAM
n261	30	SISO	Ant2	100	2	27500 - 28350	0.060	17.81	189MG7D	QPSK
n261	30	SISO	Ant2	100	2	27500 - 28350	0.040	16.05	189MW7D	16QAM
n261	30	SISO	Ant2	100	2	27500 - 28350	0.025	14.01	190MW7D	64QAM
n261	30	MIMO	Ant2	100	2	27500 - 28350	0.060	17.76	189MG7D	QPSK
n261	30	MIMO	Ant2	100	2	27500 - 28350	0.031	14.86	189MW7D	16QAM
n261	30	MIMO	Ant2	100	2	27500 - 28350	0.018	12.51	190MW7D	64QAM

EUT Overview (J Dipole / Ant2- Band n261)

Band	FCC Rule Part	Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
							Max. Power (W)	Max. Power (dBm)		
n261	30	SISO	Ant3	50	1	27500 - 28350	0.129	21.11	45M2G7D	QPSK
n261	30	SISO	Ant3	50	1	27500 - 28350	0.094	19.74	45M7W7D	16QAM
n261	30	SISO	Ant3	50	1	27500 - 28350	0.056	17.45	45M4W7D	64QAM
n261	30	MIMO	Ant3	50	1	27500 - 28350	0.122	20.87	45M2G7D	QPSK
n261	30	MIMO	Ant3	50	1	27500 - 28350	0.077	18.85	45M7W7D	16QAM
n261	30	MIMO	Ant3	50	1	27500 - 28350	0.040	16.00	45M4W7D	64QAM
n261	30	SISO	Ant3	50	2	27500 - 28350	0.080	19.02	94M8G7D	QPSK
n261	30	SISO	Ant3	50	2	27500 - 28350	0.055	17.44	94M6W7D	16QAM
n261	30	SISO	Ant3	50	2	27500 - 28350	0.037	15.64	94M9W7D	64QAM
n261	30	MIMO	Ant3	50	2	27500 - 28350	0.118	20.74	94M8G7D	QPSK
n261	30	MIMO	Ant3	50	2	27500 - 28350	0.076	18.82	94M6W7D	16QAM
n261	30	MIMO	Ant3	50	2	27500 - 28350	0.038	15.78	94M9W7D	64QAM
n261	30	SISO	Ant3	100	1	27500 - 28350	0.139	21.43	90M7G7D	QPSK
n261	30	SISO	Ant3	100	1	27500 - 28350	0.086	19.35	90M5W7D	16QAM
n261	30	SISO	Ant3	100	1	27500 - 28350	0.059	17.71	90M2W7D	64QAM
n261	30	MIMO	Ant3	100	1	27500 - 28350	0.130	21.14	90M7G7D	QPSK
n261	30	MIMO	Ant3	100	1	27500 - 28350	0.073	18.61	90M5W7D	16QAM
n261	30	MIMO	Ant3	100	1	27500 - 28350	0.046	16.62	90M2W7D	64QAM
n261	30	SISO	Ant3	100	2	27500 - 28350	0.086	19.36	190MG7D	QPSK
n261	30	SISO	Ant3	100	2	27500 - 28350	0.060	17.79	189MW7D	16QAM
n261	30	SISO	Ant3	100	2	27500 - 28350	0.040	16.02	189MW7D	64QAM
n261	30	MIMO	Ant3	100	2	27500 - 28350	0.083	19.21	190MG7D	QPSK
n261	30	MIMO	Ant3	100	2	27500 - 28350	0.070	18.43	189MW7D	16QAM
n261	30	MIMO	Ant3	100	2	27500 - 28350	0.048	16.81	189MW7D	64QAM

EUT Overview (K Patch / Ant3 - Band n261)

Band	FCC Rule Part	Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
							Max. Power (W)	Max. Power (dBm)		
n261	30	SISO	Ant4	50	1	27500 - 28350	0.147	21.68	45M9G7D	QPSK
n261	30	SISO	Ant4	50	1	27500 - 28350	0.068	18.30	45M4W7D	16QAM
n261	30	SISO	Ant4	50	1	27500 - 28350	0.050	16.98	45M2W7D	64QAM
n261	30	MIMO	Ant4	50	1	27500 - 28350	0.128	21.07	45M9G7D	QPSK
n261	30	MIMO	Ant4	50	1	27500 - 28350	0.073	18.62	45M4W7D	16QAM
n261	30	MIMO	Ant4	50	1	27500 - 28350	0.046	16.60	45M2W7D	64QAM
n261	30	SISO	Ant4	50	2	27500 - 28350	0.128	21.07	94M8G7D	QPSK
n261	30	SISO	Ant4	50	2	27500 - 28350	0.096	19.84	94M5W7D	16QAM
n261	30	SISO	Ant4	50	2	27500 - 28350	0.054	17.31	94M5W7D	64QAM
n261	30	MIMO	Ant4	50	2	27500 - 28350	0.101	20.06	94M8G7D	QPSK
n261	30	MIMO	Ant4	50	2	27500 - 28350	0.064	18.04	94M5W7D	16QAM
n261	30	MIMO	Ant4	50	2	27500 - 28350	0.036	15.55	94M5W7D	64QAM
n261	30	SISO	Ant4	100	1	27500 - 28350	0.152	21.83	90M7G7D	QPSK
n261	30	SISO	Ant4	100	1	27500 - 28350	0.090	19.56	90M7W7D	16QAM
n261	30	SISO	Ant4	100	1	27500 - 28350	0.060	17.77	90M5W7D	64QAM
n261	30	MIMO	Ant4	100	1	27500 - 28350	0.123	20.91	90M7G7D	QPSK
n261	30	MIMO	Ant4	100	1	27500 - 28350	0.063	17.96	90M7W7D	16QAM
n261	30	MIMO	Ant4	100	1	27500 - 28350	0.036	15.59	90M5W7D	64QAM
n261	30	SISO	Ant4	100	2	27500 - 28350	0.160	22.04	189MG7D	QPSK
n261	30	SISO	Ant4	100	2	27500 - 28350	0.124	20.93	189MW7D	16QAM
n261	30	SISO	Ant4	100	2	27500 - 28350	0.070	18.48	189MW7D	64QAM
n261	30	MIMO	Ant4	100	2	27500 - 28350	0.123	20.89	189MG7D	QPSK
n261	30	MIMO	Ant4	100	2	27500 - 28350	0.087	19.37	189MW7D	16QAM
n261	30	MIMO	Ant4	100	2	27500 - 28350	0.045	16.50	189MW7D	64QAM

EUT Overview (L Patch / Ant4 - Band n261)

Band	FCC Rule Part	Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
							Max. Power (W)	Max. Power (dBm)		
n260	30	SISO	Ant1	50	1	37000 - 40000	0.124	20.94	45M2G7D	QPSK
n260	30	SISO	Ant1	50	1	37000 - 40000	0.076	18.80	45M3W7D	16QAM
n260	30	SISO	Ant1	50	1	37000 - 40000	0.049	16.94	45M6W7D	64QAM
n260	30	MIMO	Ant1	50	1	37000 - 40000	0.105	20.22	45M2G7D	QPSK
n260	30	MIMO	Ant1	50	1	37000 - 40000	0.067	18.27	45M3W7D	16QAM
n260	30	MIMO	Ant1	50	1	37000 - 40000	0.046	16.61	45M6W7D	64QAM
n260	30	SISO	Ant1	50	2	37000 - 40000	0.065	18.12	94M8G7D	QPSK
n260	30	SISO	Ant1	50	2	37000 - 40000	0.045	16.53	94M8W7D	16QAM
n260	30	SISO	Ant1	50	2	37000 - 40000	0.031	14.88	94M8W7D	64QAM
n260	30	MIMO	Ant1	50	2	37000 - 40000	0.064	18.06	94M8G7D	QPSK
n260	30	MIMO	Ant1	50	2	37000 - 40000	0.034	15.31	94M8W7D	16QAM
n260	30	MIMO	Ant1	50	2	37000 - 40000	0.025	13.94	94M8W7D	64QAM
n260	30	SISO	Ant1	100	1	37000 - 40000	0.132	21.21	90M9G7D	QPSK
n260	30	SISO	Ant1	100	1	37000 - 40000	0.086	19.37	90M6W7D	16QAM
n260	30	SISO	Ant1	100	1	37000 - 40000	0.051	17.06	90M8W7D	64QAM
n260	30	MIMO	Ant1	100	1	37000 - 40000	0.136	21.34	90M9G7D	QPSK
n260	30	MIMO	Ant1	100	1	37000 - 40000	0.065	18.16	90M6W7D	16QAM
n260	30	MIMO	Ant1	100	1	37000 - 40000	0.034	15.38	90M8W7D	64QAM
n260	30	SISO	Ant1	100	2	37000 - 40000	0.070	18.43	189MG7D	QPSK
n260	30	SISO	Ant1	100	2	37000 - 40000	0.051	17.05	189MW7D	16QAM
n260	30	SISO	Ant1	100	2	37000 - 40000	0.036	15.59	190MW7D	64QAM
n260	30	MIMO	Ant1	100	2	37000 - 40000	0.080	19.06	189MG7D	QPSK
n260	30	MIMO	Ant1	100	2	37000 - 40000	0.046	16.60	189MW7D	16QAM
n260	30	MIMO	Ant1	100	2	37000 - 40000	0.027	14.34	190MW7D	64QAM

EUT Overview (J Patch / Ant1 - Band n260)

Band	FCC Rule Part	Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
							Max. Power (W)	Max. Power (dBm)		
n260	30	SISO	Ant2	50	1	37000 - 40000	0.072	18.58	45M1G7D	QPSK
n260	30	SISO	Ant2	50	1	37000 - 40000	0.046	16.59	45M1W7D	16QAM
n260	30	SISO	Ant2	50	1	37000 - 40000	0.024	13.89	45M2W7D	64QAM
n260	30	MIMO	Ant2	50	1	37000 - 40000	0.075	18.76	45M1G7D	QPSK
n260	30	MIMO	Ant2	50	1	37000 - 40000	0.037	15.69	45M1W7D	16QAM
n260	30	MIMO	Ant2	50	1	37000 - 40000	0.018	12.45	45M2W7D	64QAM
n260	30	SISO	Ant2	50	2	37000 - 40000	0.054	17.29	94M6G7D	QPSK
n260	30	SISO	Ant2	50	2	37000 - 40000	0.033	15.24	95M3W7D	16QAM
n260	30	SISO	Ant2	50	2	37000 - 40000	0.023	13.53	95M7W7D	64QAM
n260	30	MIMO	Ant2	50	2	37000 - 40000	0.058	17.66	94M6G7D	QPSK
n260	30	MIMO	Ant2	50	2	37000 - 40000	0.027	14.36	95M3W7D	16QAM
n260	30	MIMO	Ant2	50	2	37000 - 40000	0.015	11.71	95M7W7D	64QAM
n260	30	SISO	Ant2	100	1	37000 - 40000	0.071	18.51	90M5G7D	QPSK
n260	30	SISO	Ant2	100	1	37000 - 40000	0.041	16.10	90M5W7D	16QAM
n260	30	SISO	Ant2	100	1	37000 - 40000	0.023	13.65	91M2W7D	64QAM
n260	30	MIMO	Ant2	100	1	37000 - 40000	0.072	18.57	90M5G7D	QPSK
n260	30	MIMO	Ant2	100	1	37000 - 40000	0.033	15.19	90M5W7D	16QAM
n260	30	MIMO	Ant2	100	1	37000 - 40000	0.018	12.56	91M2W7D	64QAM
n260	30	SISO	Ant2	100	2	37000 - 40000	0.045	16.49	190MG7D	QPSK
n260	30	SISO	Ant2	100	2	37000 - 40000	0.034	15.37	191MW7D	16QAM
n260	30	SISO	Ant2	100	2	37000 - 40000	0.027	14.36	195MW7D	64QAM
n260	30	MIMO	Ant2	100	2	37000 - 40000	0.050	17.01	190MG7D	QPSK
n260	30	MIMO	Ant2	100	2	37000 - 40000	0.031	14.89	191MW7D	16QAM
n260	30	MIMO	Ant2	100	2	37000 - 40000	0.019	12.89	195MW7D	64QAM

EUT Overview (J Dipole / Ant2 - Band n260)

Band	FCC Rule Part	Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
							Max. Power (W)	Max. Power (dBm)		
n260	30	SISO	Ant3	50	1	37000 - 40000	0.156	21.94	45M6G7D	QPSK
n260	30	SISO	Ant3	50	1	37000 - 40000	0.110	20.42	45M2W7D	16QAM
n260	30	SISO	Ant3	50	1	37000 - 40000	0.066	18.21	45M3W7D	64QAM
n260	30	MIMO	Ant3	50	1	37000 - 40000	0.151	21.79	45M6G7D	QPSK
n260	30	MIMO	Ant3	50	1	37000 - 40000	0.130	21.12	45M2W7D	16QAM
n260	30	MIMO	Ant3	50	1	37000 - 40000	0.084	19.22	45M3W7D	64QAM
n260	30	SISO	Ant3	50	2	37000 - 40000	0.154	21.88	94M3G7D	QPSK
n260	30	SISO	Ant3	50	2	37000 - 40000	0.105	20.20	94M9W7D	16QAM
n260	30	SISO	Ant3	50	2	37000 - 40000	0.068	18.36	94M9W7D	64QAM
n260	30	MIMO	Ant3	50	2	37000 - 40000	0.187	22.71	94M3G7D	QPSK
n260	30	MIMO	Ant3	50	2	37000 - 40000	0.115	20.61	94M9W7D	16QAM
n260	30	MIMO	Ant3	50	2	37000 - 40000	0.056	17.48	94M9W7D	64QAM
n260	30	SISO	Ant3	100	1	37000 - 40000	0.170	22.32	92M3G7D	QPSK
n260	30	SISO	Ant3	100	1	37000 - 40000	0.120	20.81	91M0W7D	16QAM
n260	30	SISO	Ant3	100	1	37000 - 40000	0.075	18.73	91M9W7D	64QAM
n260	30	MIMO	Ant3	100	1	37000 - 40000	0.169	22.27	92M3G7D	QPSK
n260	30	MIMO	Ant3	100	1	37000 - 40000	0.097	19.87	91M0W7D	16QAM
n260	30	MIMO	Ant3	100	1	37000 - 40000	0.057	17.54	91M9W7D	64QAM
n260	30	SISO	Ant3	100	2	37000 - 40000	0.207	23.17	189MG7D	QPSK
n260	30	SISO	Ant3	100	2	37000 - 40000	0.153	21.85	190MW7D	16QAM
n260	30	SISO	Ant3	100	2	37000 - 40000	0.092	19.66	190MW7D	64QAM
n260	30	MIMO	Ant3	100	2	37000 - 40000	0.223	23.49	189MG7D	QPSK
n260	30	MIMO	Ant3	100	2	37000 - 40000	0.117	20.66	190MW7D	16QAM
n260	30	MIMO	Ant3	100	2	37000 - 40000	0.063	18.02	190MW7D	64QAM

EUT Overview (K Patch / Ant3 - Band n260)

Band	FCC Rule Part	Mode	Antenna	Bandwidth (MHz)	CCs Active	Tx Frequency (MHz)	EIRP		Emission Designator	Modulation
							Max. Power (W)	Max. Power (dBm)		
n260	30	SISO	Ant4	50	1	37000 - 40000	0.251	23.99	45M4G7D	QPSK
n260	30	SISO	Ant4	50	1	37000 - 40000	0.148	21.70	45M4W7D	16QAM
n260	30	SISO	Ant4	50	1	37000 - 40000	0.093	19.67	45M3W7D	64QAM
n260	30	MIMO	Ant4	50	1	37000 - 40000	0.285	24.55	45M4G7D	QPSK
n260	30	MIMO	Ant4	50	1	37000 - 40000	0.143	21.57	45M4W7D	16QAM
n260	30	MIMO	Ant4	50	1	37000 - 40000	0.071	18.54	45M3W7D	64QAM
n260	30	SISO	Ant4	50	2	37000 - 40000	0.207	23.15	94M6G7D	QPSK
n260	30	SISO	Ant4	50	2	37000 - 40000	0.151	21.79	94M6W7D	16QAM
n260	30	SISO	Ant4	50	2	37000 - 40000	0.093	19.69	95M1W7D	64QAM
n260	30	MIMO	Ant4	50	2	37000 - 40000	0.226	23.53	94M6G7D	QPSK
n260	30	MIMO	Ant4	50	2	37000 - 40000	0.121	20.82	94M6W7D	16QAM
n260	30	MIMO	Ant4	50	2	37000 - 40000	0.063	18.00	95M1W7D	64QAM
n260	30	SISO	Ant4	100	1	37000 - 40000	0.265	24.24	90M5G7D	QPSK
n260	30	SISO	Ant4	100	1	37000 - 40000	0.158	21.99	90M7W7D	16QAM
n260	30	SISO	Ant4	100	1	37000 - 40000	0.097	19.87	90M9W7D	64QAM
n260	30	MIMO	Ant4	100	1	37000 - 40000	0.309	24.90	90M5G7D	QPSK
n260	30	MIMO	Ant4	100	1	37000 - 40000	0.150	21.75	90M7W7D	16QAM
n260	30	MIMO	Ant4	100	1	37000 - 40000	0.078	18.91	90M9W7D	64QAM
n260	30	SISO	Ant4	100	2	37000 - 40000	0.218	23.39	189MG7D	QPSK
n260	30	SISO	Ant4	100	2	37000 - 40000	0.156	21.94	190MW7D	16QAM
n260	30	SISO	Ant4	100	2	37000 - 40000	0.097	19.85	190MW7D	64QAM
n260	30	MIMO	Ant4	100	2	37000 - 40000	0.265	24.24	189MG7D	QPSK
n260	30	MIMO	Ant4	100	2	37000 - 40000	0.128	21.06	190MW7D	16QAM
n260	30	MIMO	Ant4	100	2	37000 - 40000	0.069	18.41	190MW7D	64QAM

EUT Overview (L Patch / Ant4 - Band n260)

1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Innovation, Science and Economic Development Canada.

1.2 PCTEST Test Location

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014.

1.3 Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.

- PCTEST is an ISO 17025-2005 accredited test facility under the American Association for Laboratory Accreditation (A2LA) with Certificate number 2041.01 for Specific Absorption Rate (SAR), Hearing Aid Compatibility (HAC) testing, where applicable, and Electromagnetic Compatibility (EMC) testing for FCC and Innovation, Science, and Economic Development Canada rules.

- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC 17065-2012 by A2LA (Certificate number 2041.03) in all scopes of FCC Rules and ISED Standards (RSS).

- PCTEST facility is a registered (2451B) test laboratory with the site description on file with ISED.

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Samsung Portable Handset FCC ID: A3LSMG986U**. The test data contained in this report pertains only to the emissions due to the EUT's 5G mmWave function.

The EUT has 2 array antenna configurations. Type1: 4 patches and 4 dipoles, placed on the rear side (denoted as J Patch and J Dipole). Type 2: 4 patches only, placed on the left and right side (denoted as K patch and L Patch). Each of the patch antennas is comprised of two separate antenna feeds - one for horizontal and one for vertical polarization. Only one array antenna can be active at a time. Dipole antenna does not radiate when patch antenna radiates.

The EUT supports up to 8CC for DL, and 2CC for UL. For each CC, the EUT supports both 50MHz bandwidth and 100MHz bandwidth. For modulation, the EUT supports a subcarrier spacing (SCS) of 120kHz with two transmission schemes, CP-OFDM and DFT-s-OFDM, with QPSK, 16-QAM, and 64-QAM modulations. Different Beam IDs are supported, each corresponding to a different position in space for each antenna. During testing, FTM (Factory Test Mode) was used to operate the transmitter. MIMO operation was achieved by enabling two Beam IDs at the same time: one is from the list of H Beam IDs and other is from the list of V Beam IDs.

Antenna	Name
Ant1	J Patch
Ant2	J Dipole
Ant3	K Patch
Ant4	L Patch

Test Device Serial No.: 0923M, 0950M

2.2 Device Capabilities

This device contains the following capabilities:

850/1900 CDMA/EvDO Rev0/A, 1x Advanced (BC0, BC1, BC10), 850/1900 GSM/GPRS/EDGE, 850/1700/1900 WCDMA/HSPA, Multi-band LTE, 5G NR (n71, n5, n66, n2, n41, n260, n261), 802.11b/g/n/ax WLAN, 802.11a/n/ac/ax UNII, Bluetooth (1x, EDR, LE), NFC, ANT+, Wireless Power Transfer

2.3 Test Configuration

The EUT was tested per the guidance of KDB 842590 D01 v01 and ANSI C63.26-2015. See Section 7.0 of this test report for a description of the radiated tests.

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 were used for final measurements.

All testing was performed using FTM (Factory Test Mode) software at continuous Tx operation. When implemented out in the field, the EUT will operate with a maximum uplink configuration (i.e., a maximum uplink duty cycle of 100%). The FTM software was also used for the EUT operation in the ENDC mode.

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

3.0 DESCRIPTION OF TESTS

3.1 Measurement Procedure

The measurement procedures described in the document titled "American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services" (ANSI C63.26-2015) and the guidance provided in KDB 842590 D01 v01 were used in the measurement of the EUT.

3.2 Radiated Power and Radiated Spurious Emissions

§30.202, §30.203

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. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. 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 function 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 test table to bring the total table height to 1.5m for measurements above 1GHz.

Radiated power (EIRP) measurements were performed in a full anechoic chamber (FAC) conforming to the site validation requirements of CISPR 16-1-4. Radiated spurious emission measurements from 30MHz - 18GHz were performed in a semi anechoic chamber (SAC) conforming to the site validation requirements of CISPR 16-1-4. A positioner was used to manipulate the EUT through several positions in space by rotating about the roll axis as shown in the figure below. The positioner was mounted on top of a turntable bringing the total EUT height to 1.5m.

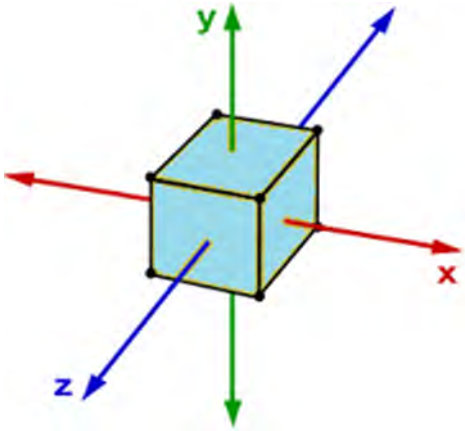


Figure 3-1. Rotation of the EUT Through Three Orthogonal Planes

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable. The measurement antenna is in the far field of the EUT per formula $2D^2/\lambda$ where D is the larger between the dimension of the measurement antenna and the transmitting antenna of the EUT. In this case, "D" is the largest dimension of the measurement antenna. The EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer.

Frequency Range (GHz)	Wavelength(cm)	Far Field Distance (m)	Measurement Distance (m)
18-40	0.749	0.54	1.00
40-60	0.500	1.39	1.50
60-90	0.333	0.91	1.00
90-140	0.214	0.58	1.00
140-200	0.150	0.39	1.00

Table 3-1. Far-Field Distance & Measurment Distance per Frequency Range

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.

The maximized power level is recorded using the spectrum analyzer “Channel Power” function with the integration bandwidth set to the emissions’ occupied bandwidth. The EIRP is calculated from the raw power level measured with the spectrum analyzer using the formulas shown below.

Effective Isotropic Radiated Power Sample Calculation

The measured e.i.r.p is converted to E-field in V/m. Then, the distance correction is applied before converting back to calculated e.i.r.p, as explained in KDB 971168 D01.

Field Strength [dBµV/m] = Measured Value [dBm] + AFCL [dB/m] + 107

= - 32.74 dBm + (40.7dB/m + 8.78dB) + 107 = 123.74dBuV/m

= 10^(123.74/20)/1000000 = 1.54 V/m

e.i.r.p. [dBm] = 10 * log((E-Field*D_m)^2/30) + 30dB

= 10*log((1.54V/m * 1.00m)^2/30) + 30dB

= 18.98 dBm e.i.r.p.

Sample MIMO e.i.r.p. Calculation:

The e.i.r.p of the H Beam and V Beam were first measured individually. The measured values were then summed in linear power units then converted back to dBm per the guidance of KDB 662911 D01.

Conversion to linear value = 10^(e.i.r.p/10) = 10^(17.45/10) = 55.59mW

MIMO e.i.r.p. = $e.i.r.p._H$ + $e.i.r.p._V$

= 55.59mW + 20.04mW

=10*log(75.63mW)

= 18.79dBm

4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95% level of confidence. The measurement uncertainty shown below meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty (±dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to an accredited ISO/IEC 17025 calibration facility. Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2017.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	N9030A	PXA Signal Analyzer (44GHz)	6/12/2019	Annual	6/12/2020	MY52350166
Agilent	N9030A	50GHz PXA Signal Analyzer	11/22/2019	Annual	11/22/2020	US51350301
COM-Power	AL-130R	Active Loop Antenna	8/22/2019	Annual	8/22/2020	121085
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	5/10/2019	Annual	5/10/2020	441112
Emco	3115	Horn Antenna (1-18GHz)	3/28/2018	Biennial	3/28/2020	9704-5182
Espec	ESX-2CA	Environmental Chamber	6/13/2019	Annual	6/13/2020	17620
ETS-Lindgren	3116C	DRG Horn Antenna	3/11/2019	Annual	3/11/2020	218893
Keysight Technologies	N9030A	3Hz-44GHz PXA Signal Analyzer	5/2/2019	Annual	5/2/2020	MY49430494
OML Inc.	M05RH	WR-05 Horn antenna,24 dBi, 140 to 200GHz	10/31/2019	Annual	10/31/2020	18073001
OML Inc.	M08RH	WR-08 Horn Antenna, 24dBi, 90 to 140 GHz	7/30/2018	Biennial	7/30/2020	18073001
OML Inc.	M12RH	WR-12 Horn Antenna, 24dBi, 60 to 90 GHz	10/31/2019	Annual	10/31/2020	18073001
OML Inc.	M19RH	WR-19 Horn Antenna, 24dBi, 40 to 60 GHz	10/31/2019	Annual	10/31/2020	18073001
Rohde & Schwarz	180-442-KF	Horn (Small)	8/21/2018	Biennial	8/21/2020	U157403-01
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	6/5/2019	Annual	6/5/2020	100342
Rohde & Schwarz	ESW44	EMI Test Receiver 2Hz to 44 GHz	10/16/2019	Annual	10/16/2020	101716
Rohde & Schwarz	FSW67	Signal / Spectrum Analyzer	5/6/2019	Annual	5/6/2020	103200
Rohde & Schwarz	SFUNIT-Rx	Shielded Filter Unit	7/8/2019	Annual	7/8/2020	102133
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	4/19/2018	Biennial	4/19/2020	A051107
Virginia Diodes Inc	SAX252	SAX Module (60 - 90GHz)	9/30/2019	Annual	9/30/2020	SAX252
Virginia Diodes Inc	SAX253	SAX Module (90 - 140GHz)	9/30/2019	Annual	9/30/2020	SAX253
Virginia Diodes Inc	SAX254	SAX Module (140 - 220GHz)	9/30/2019	Annual	9/30/2020	SAX254
Virginia Diodes Inc	SAX411	SAX Module (40 - 60GHz)	10/2/2019	Annual	10/2/2020	SAX411

Table 5-1. Test Equipment

Notes:

For equipment listed above that has a calibration date or calibration due date that falls within the test date range, care was taken to ensure that this equipment was used after the calibration date and before the calibration due date.

6.0 SAMPLE CALCULATIONS

Emission Designator

QPSK Modulation

Emission Designator = 800MG7D

BW = 800 MHz
G = Phase Modulation
7 = Quantized/Digital Info
D = Data transmission, telemetry, telecommand

QAM Modulation

Emission Designator = 802MW7D

BW = 802 MHz
W = Amplitude/Angle Modulated
7 = Quantized/Digital Info
D = Data transmission, telemetry, telecommand

7.0 TEST RESULTS

7.1 Summary

Company Name: Samsung Electronics Co., Ltd.

FCC ID: A3LSMG986U

FCC Classification: Part 30 Mobile Transmitter (5GM)

Mode(s): TDD

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
2.1049	Occupied Bandwidth	N/A	RADIATED	PASS	Section 7.2
2.1046, 30.202	Equivalent Isotropic Radiated Power	43dBm		PASS	Section 7.3
2.1051, 30.203	Spurious Emissions	-13dBm/MHz for all out-of-band emissions		PASS	Section 7.4
2.1051, 30.203	Out-of-Band Emissions at the Band Edge	-13dBm/MHz for all out-of-band emissions, -5dBm/MHz from the band edge up to 10% of the channel BW		PASS	Section 7.5
2.1055	Frequency Stability	Fundamental emissions stay within authorized frequency block		PASS	Section 7.6

Table 7-1. Summary of Radiated Test Results

Notes:

1) All modes of operation and modulations were investigated. The test results shown in the following sections represent the worst case emissions.
2) Per 2.1057(a)(2), spurious emissions were investigated up to 100GHz for n261 and up to 200GHz for n260.
3) All radiated emission measurements at the band edge 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.
4) The radiated RF output power and all out-of-band emissions in the spurious domain are evaluated to the EIRP limits.
5) "CC" refers to "Component Carriers".
6) Beam IDs were chosed based on which Beam ID produces the highest EIRP during EIRP simulation.
7) All testing was performed using FTM (Factory Test Mode) software at continuous Tx operation (100% duty cycle).
8) The CP-OFDM and DFT-s-OFDM QPSK transmission schemes were investigated fully for each test type and only the worst case data is included.

7.2 Occupied Bandwidth

§2.1049

Test Overview

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. All modes of operation were investigated and the worst case configuration results are reported in this section.

Test Procedure Used

ANSI C63.26-2015 Section 5.4.3
KDB 842590 D01 v01 Section 4.3

Test Settings

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

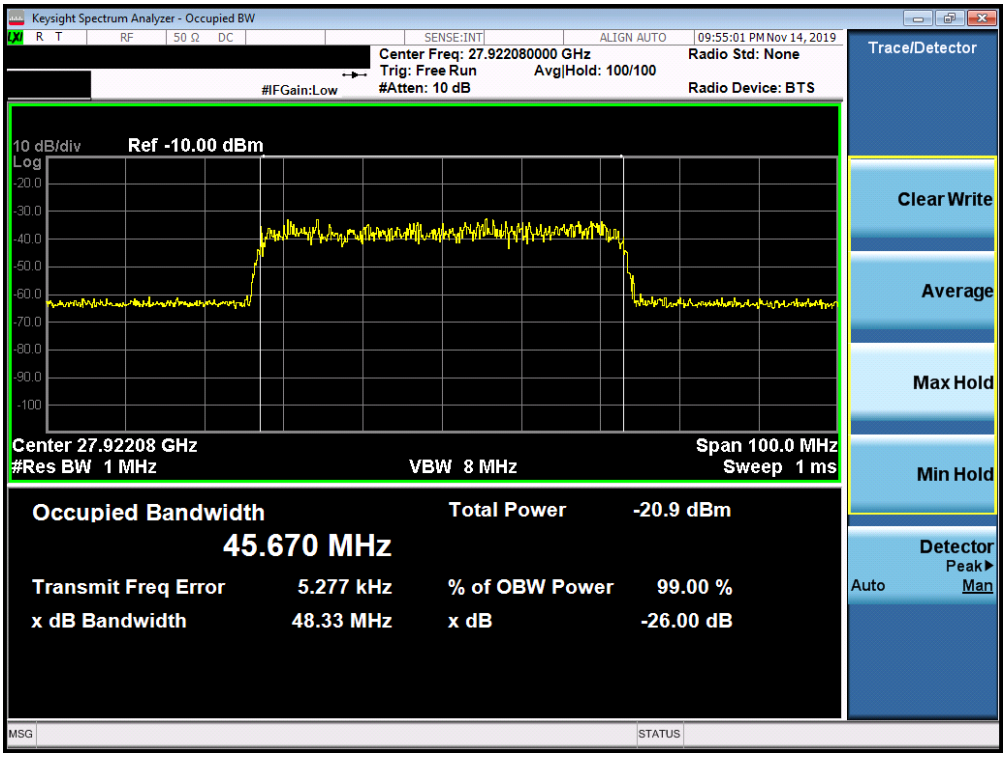
Test Notes

The EUT supports CP (QPSK) and DFT-s (QPSK). Both the types of QPSK modulations were investigated in detail. Data for the worst case has been included in the report.

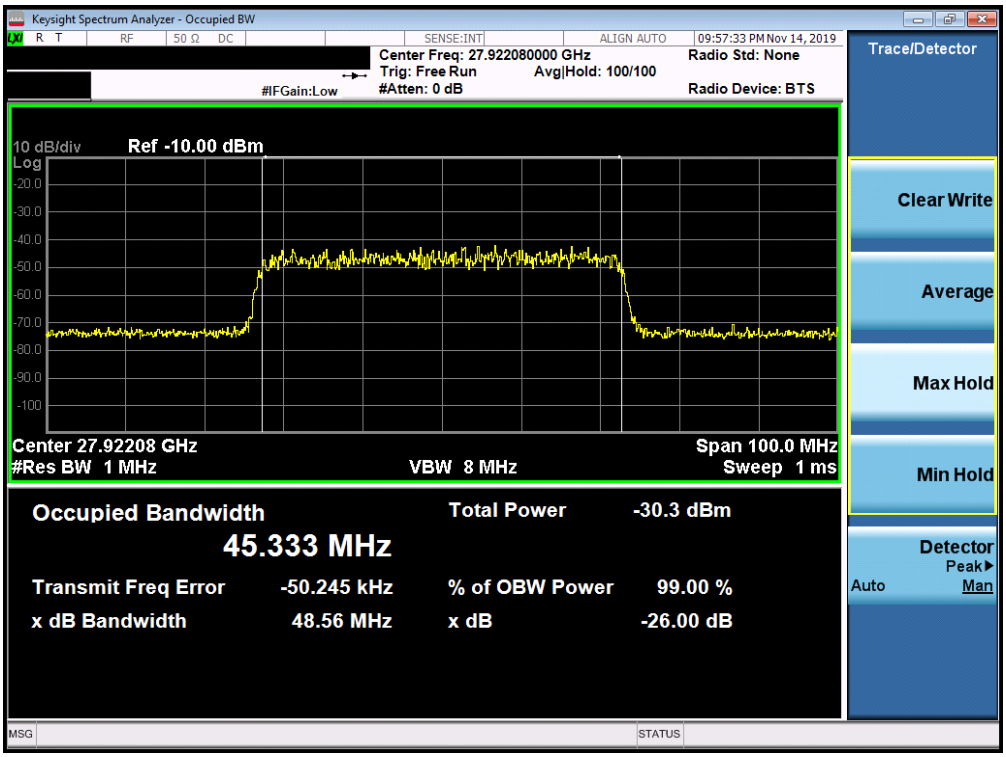
Band n261

Channel	Bandwidth	CCs Active	Modulation	OBW [MHz]
Mid	50	1	QPSK	45.67
			16QAM	45.33
			64QAM	45.23
		2	QPSK	94.89
			16QAM	94.59
			64QAM	94.43
	100	1	QPSK	90.72
			16QAM	90.54
			64QAM	90.79
		2	QPSK	189.09
			16QAM	188.94
			64QAM	189.53

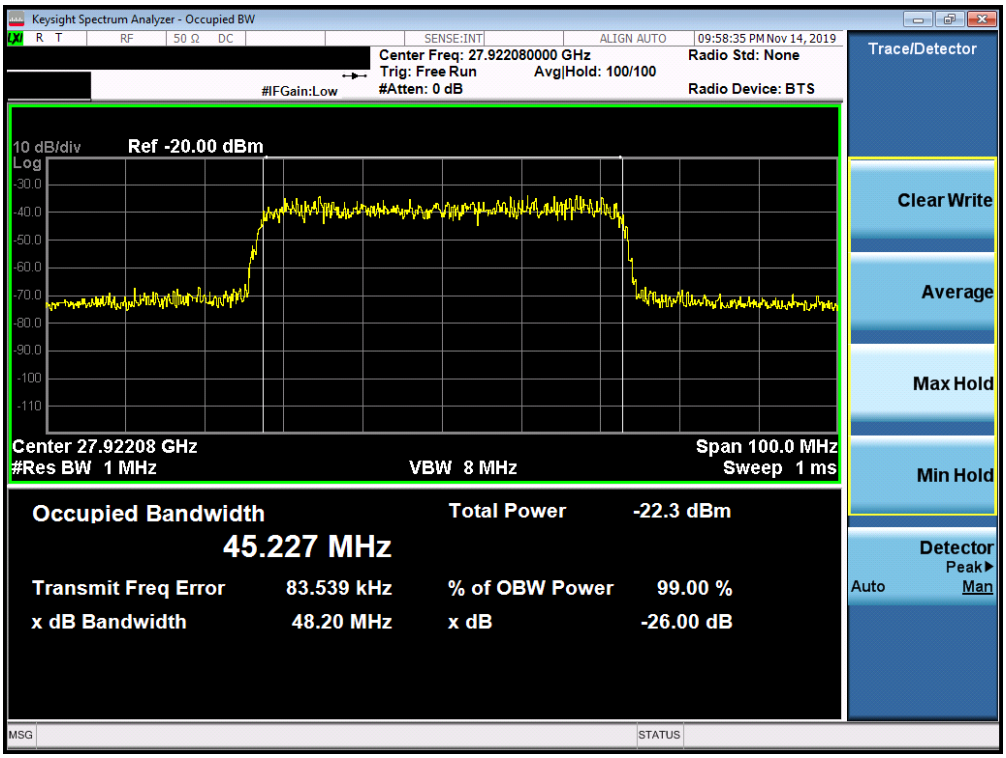
Table 7-2. Summary of Ant1 Occupied Bandwidths (n261)



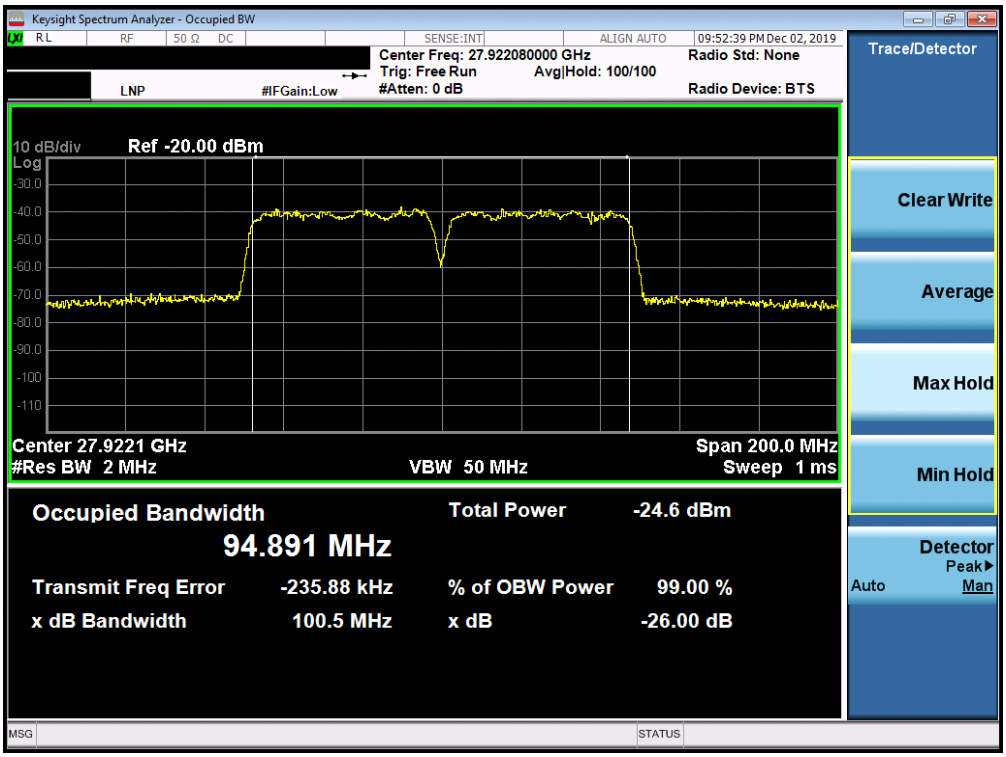
Plot 7-1. Ant1 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)



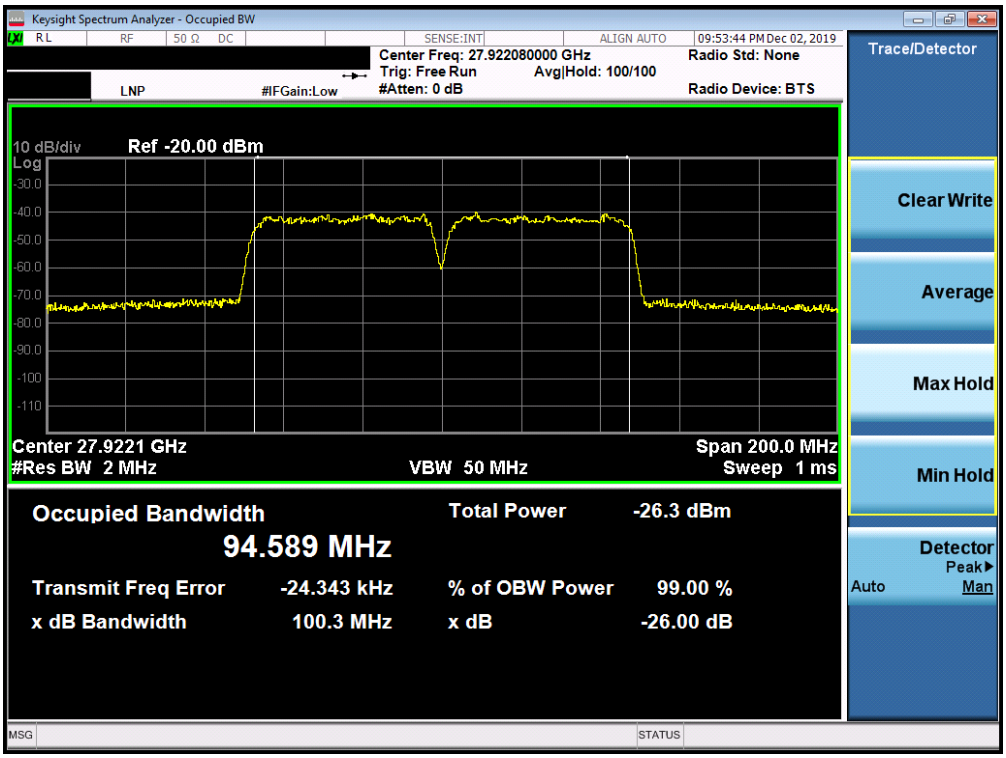
Plot 7-2. Ant1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



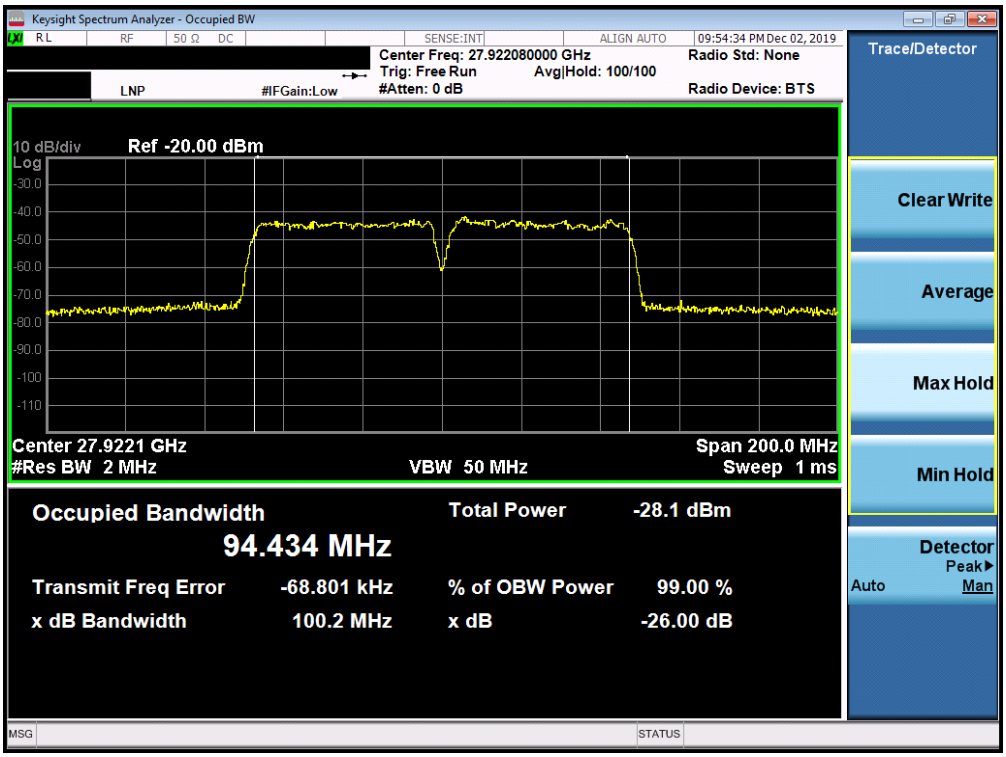
Plot 7-3. Ant1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



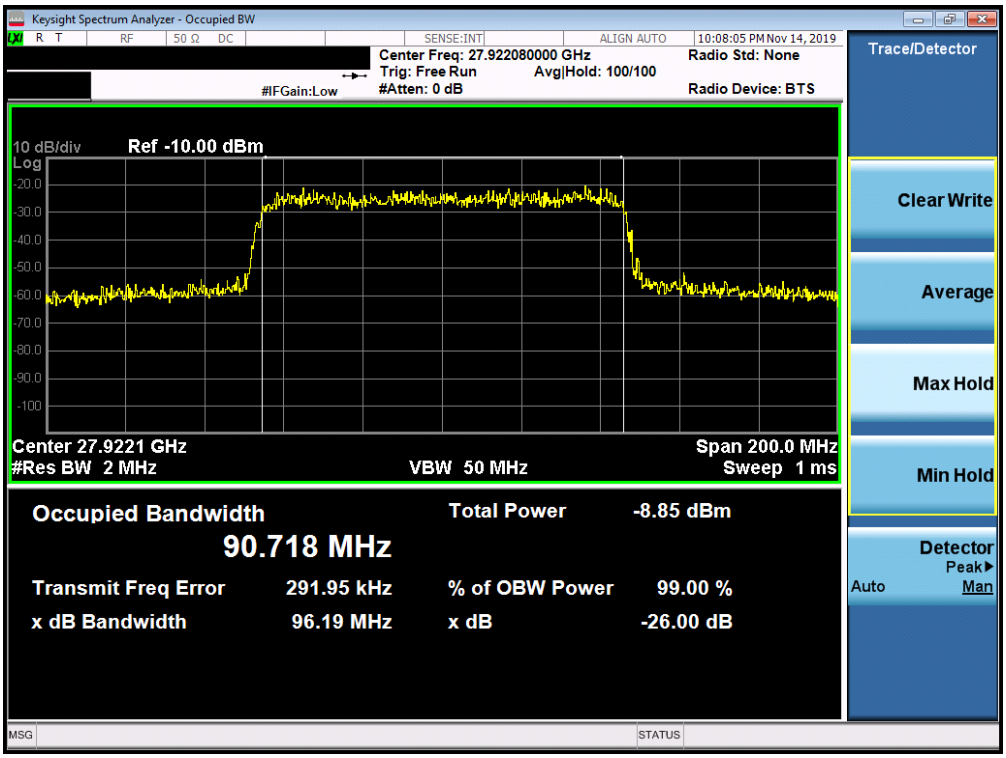
Plot 7-4. Ant1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



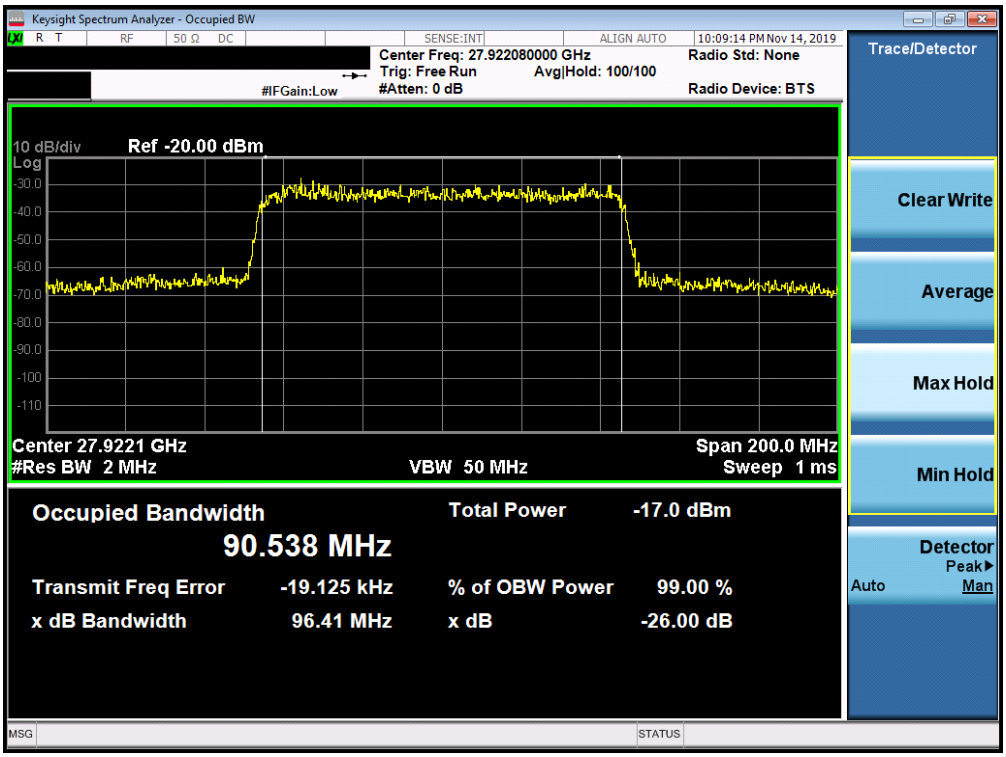
Plot 7-5. Ant1 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



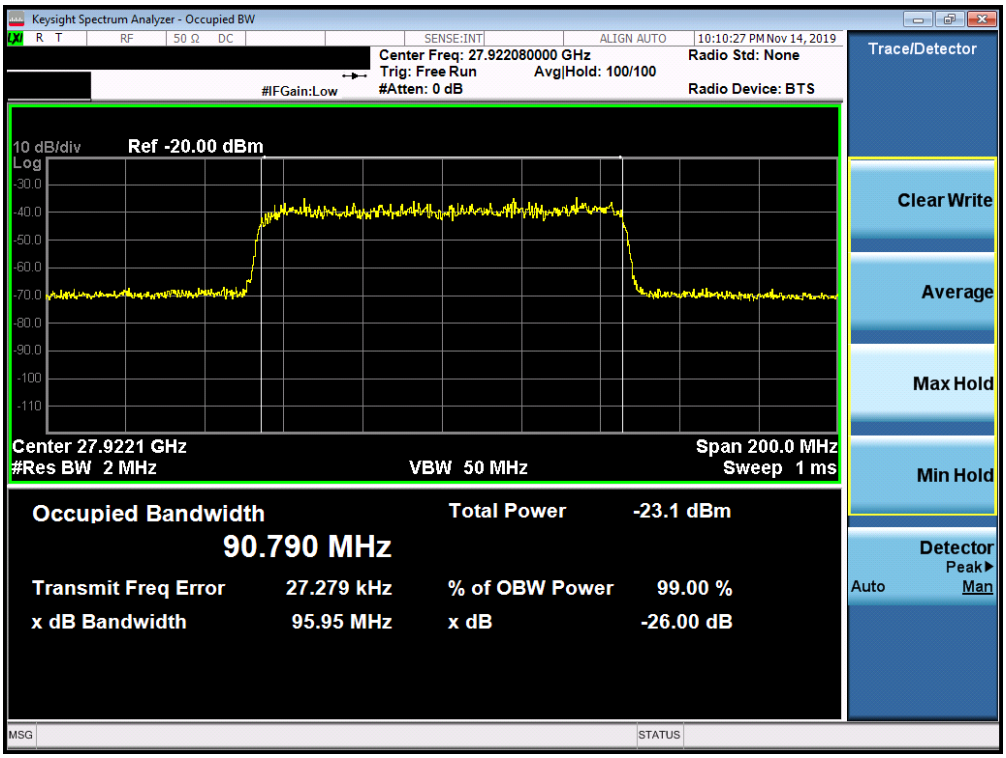
Plot 7-6. Ant1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)



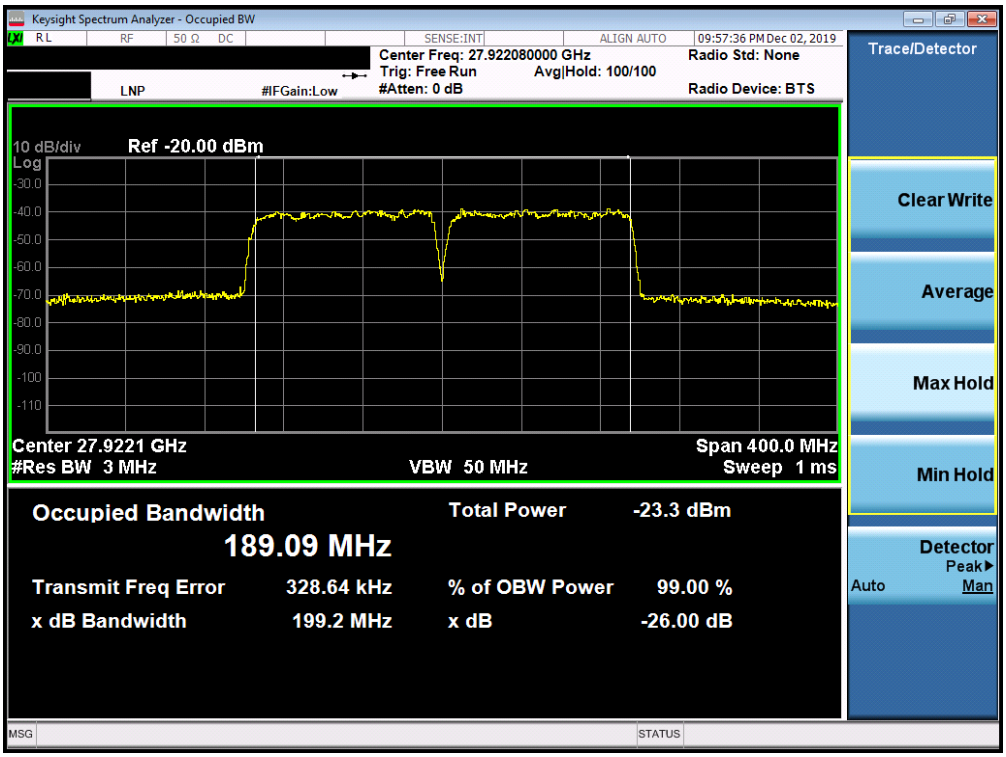
Plot 7-7. Ant1 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)



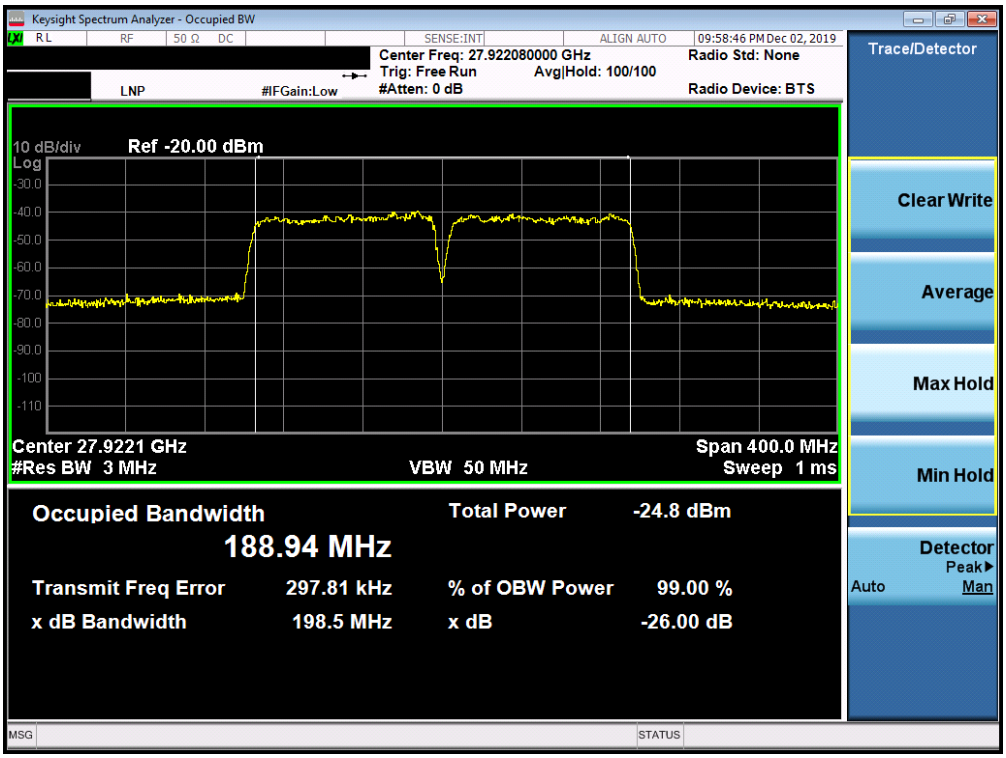
Plot 7-8. Ant1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



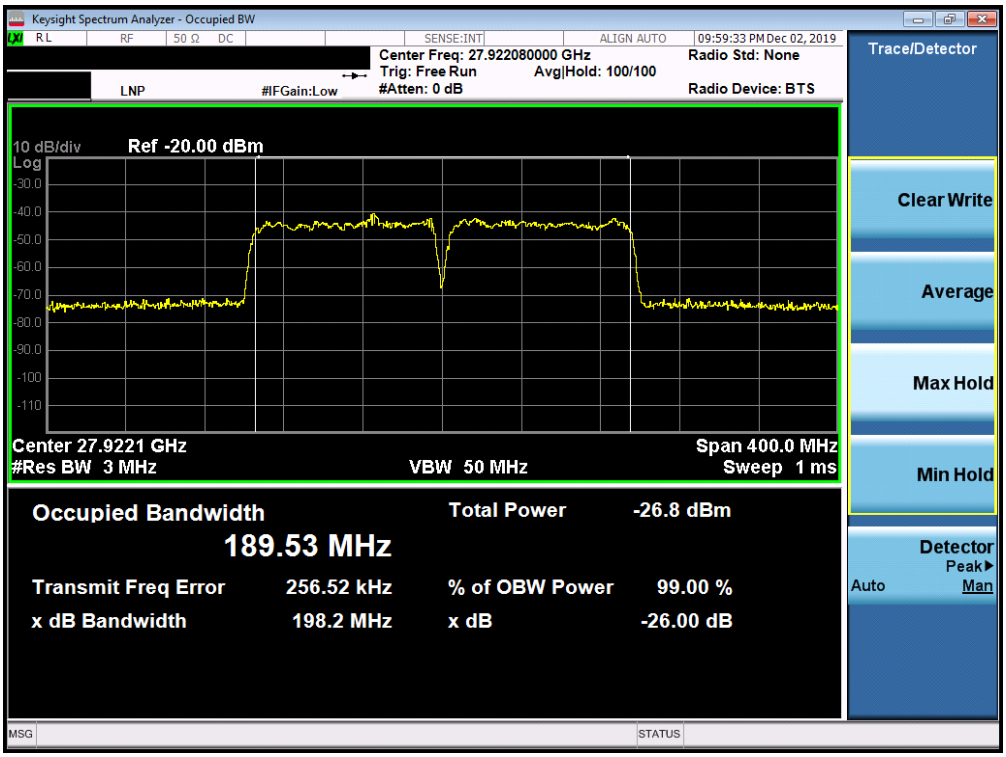
Plot 7-9. Ant1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



Plot 7-10. Ant1 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)



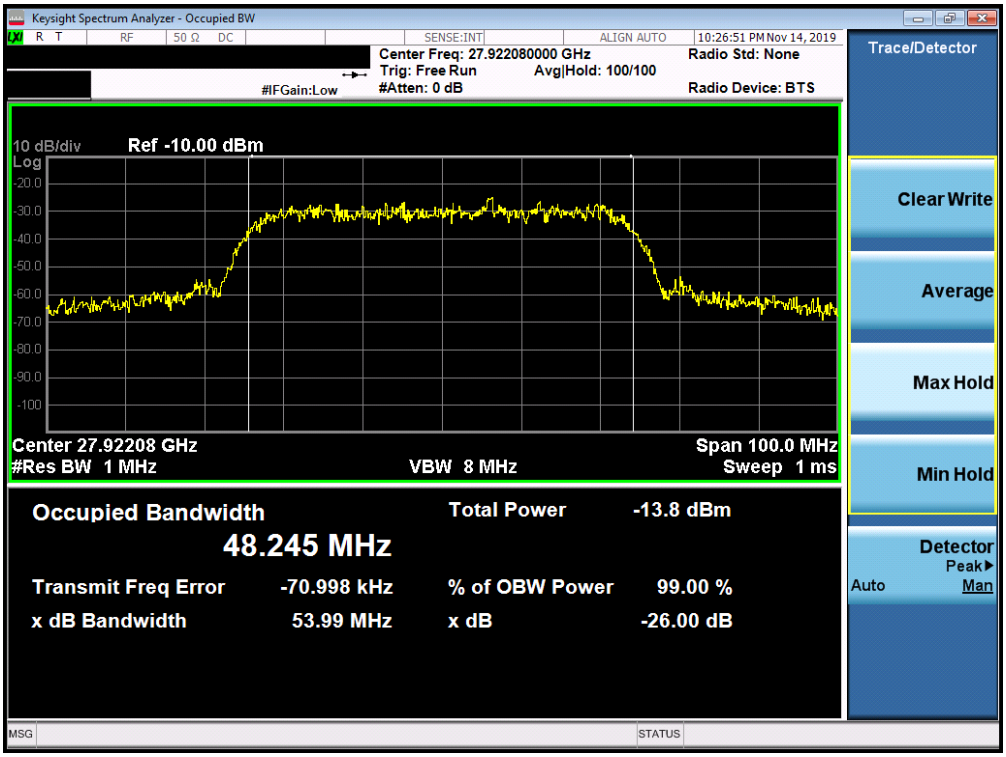
Plot 7-11. Ant1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)



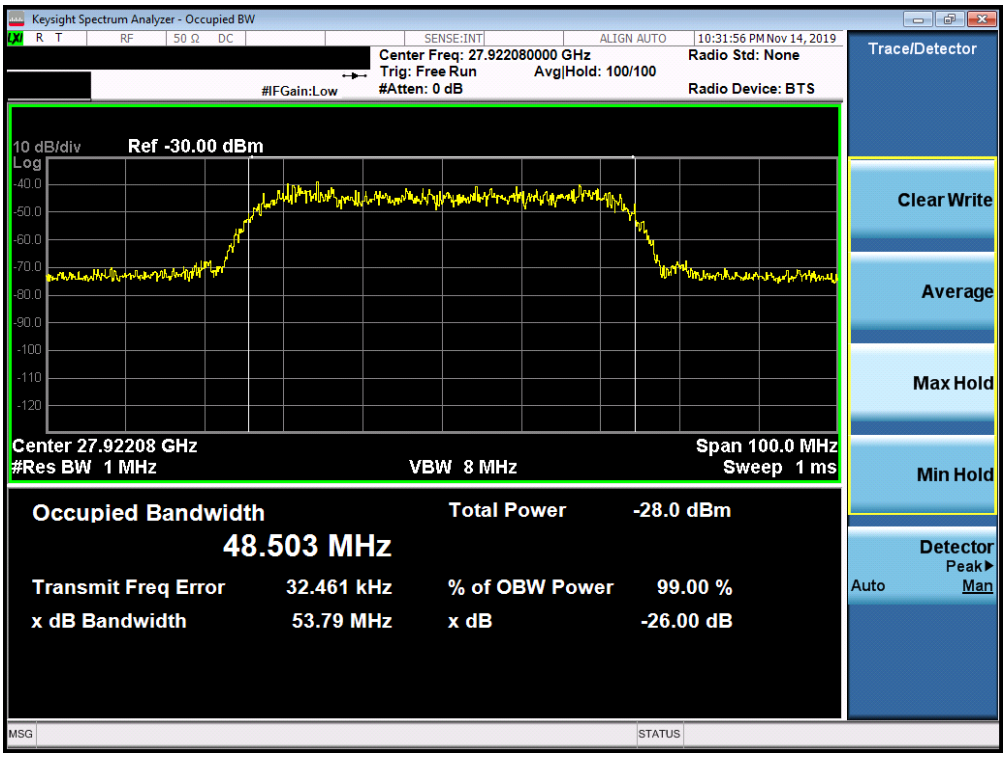
Plot 7-12. Ant1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

Channel	Bandwidth	CCs Active	Modulation	OBW [MHz]
Mid	50	1	QPSK	48.25
			16QAM	48.50
			64QAM	48.14
		2	QPSK	94.88
			16QAM	94.64
			64QAM	95.04
	100	1	QPSK	90.41
			16QAM	90.53
			64QAM	90.16
		2	QPSK	189.44
			16QAM	189.40
			64QAM	190.22

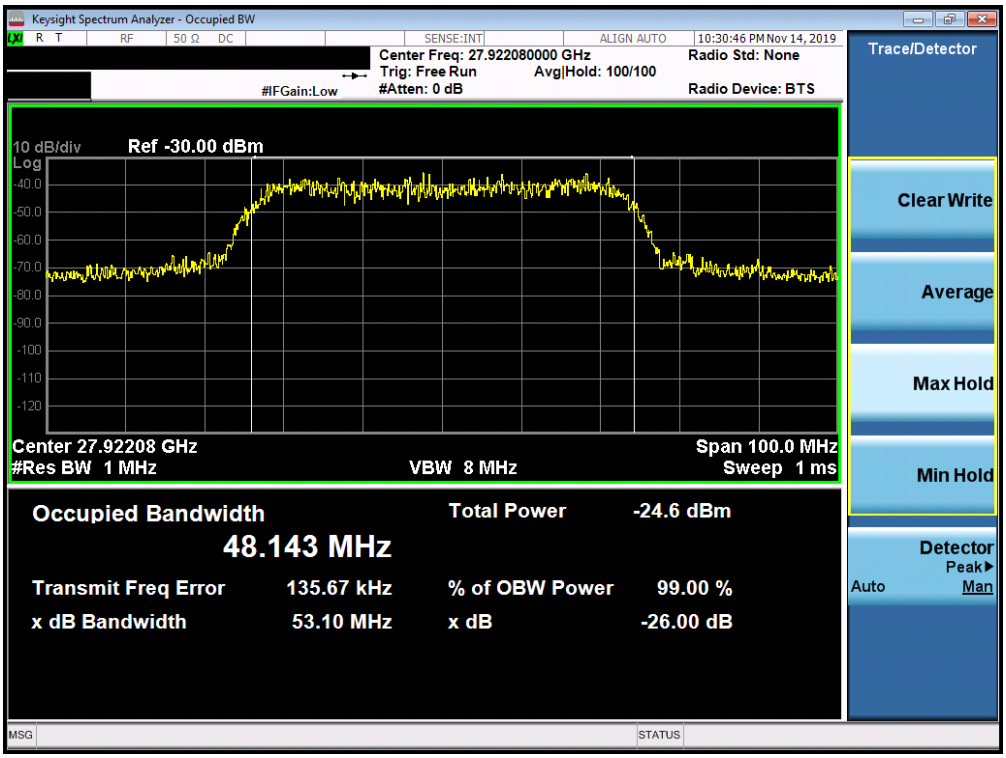
Table 7-3. Summary of Ant2 Occupied Bandwidths (n261)



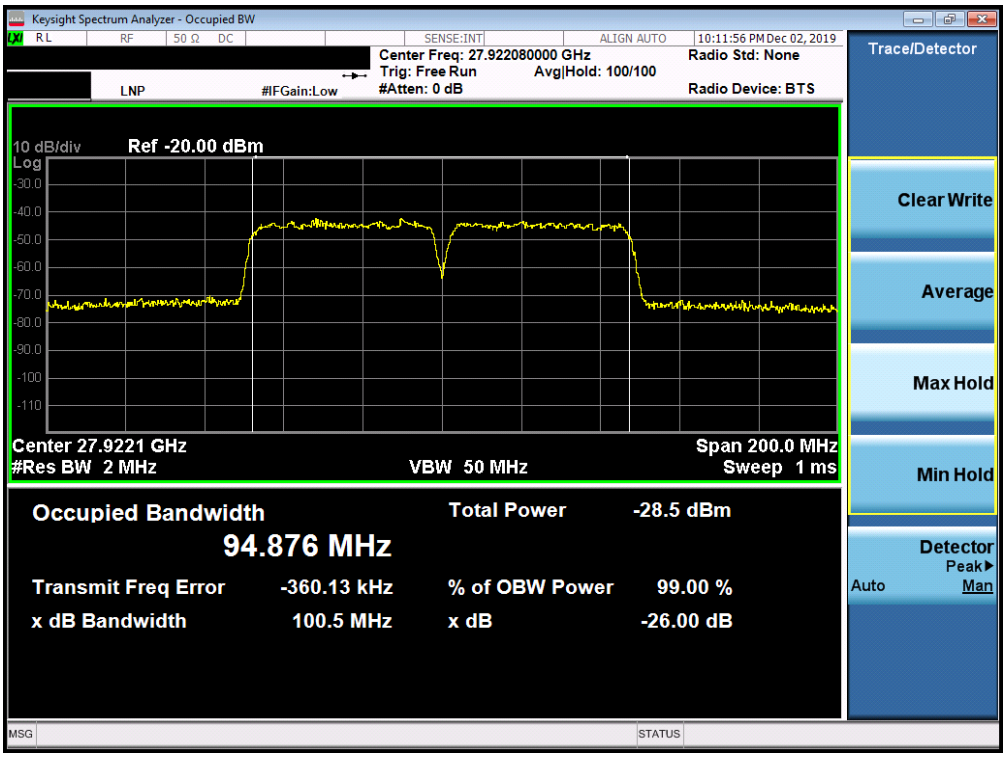
Plot 7-13. Ant2 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)



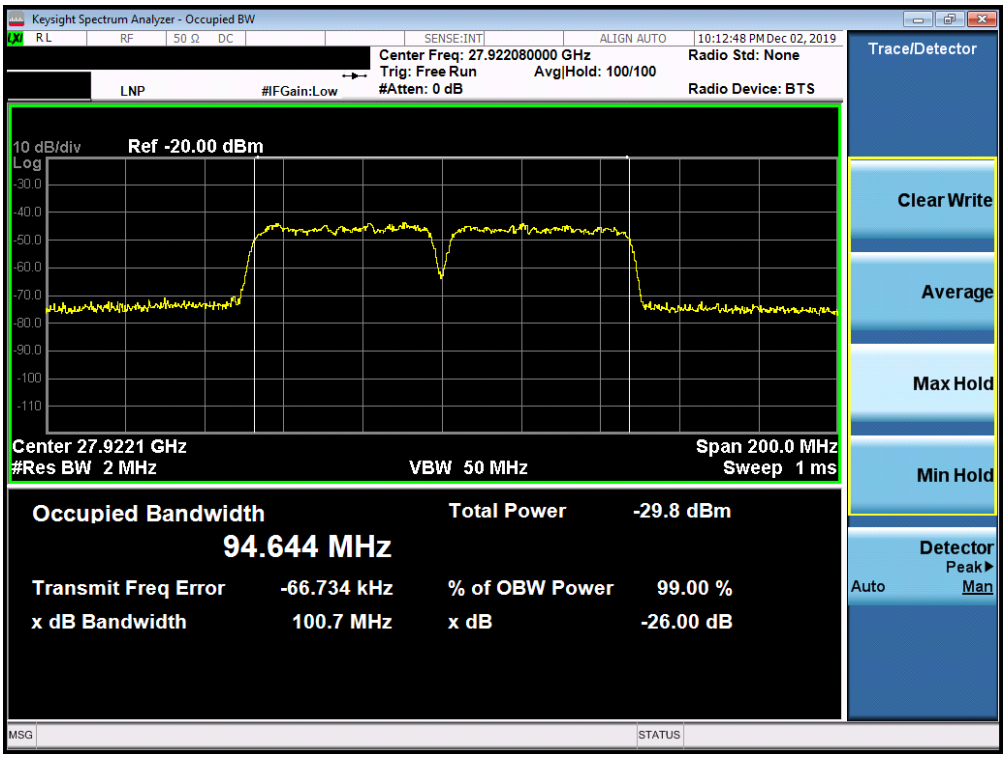
Plot 7-14. Ant2 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



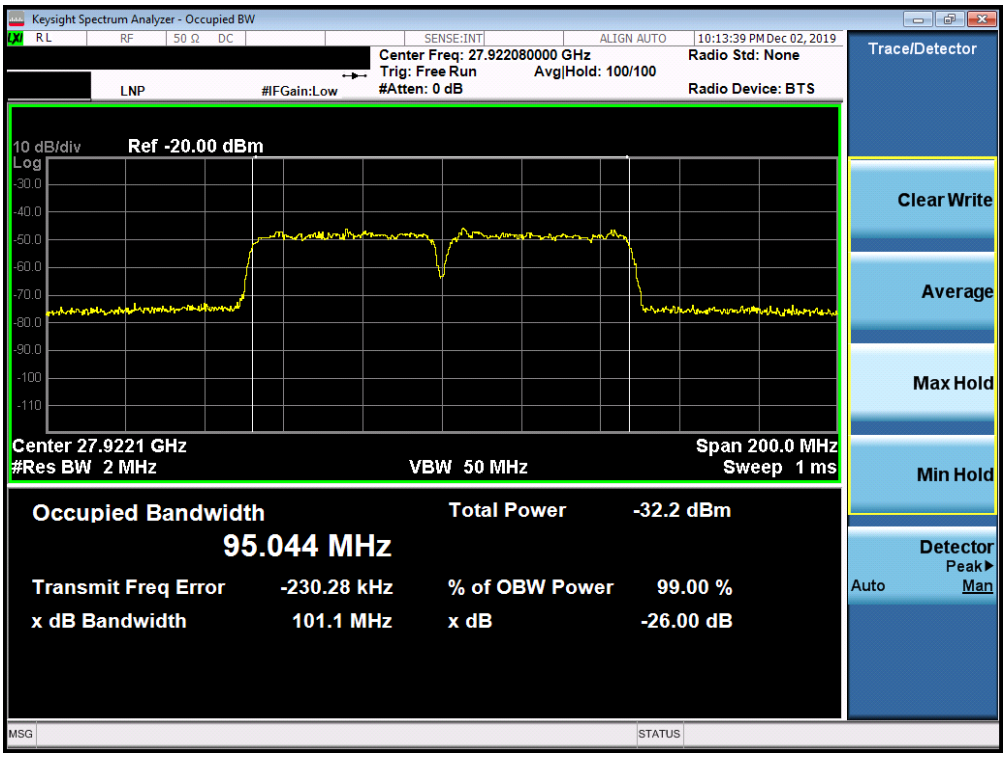
Plot 7-15. Ant2 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



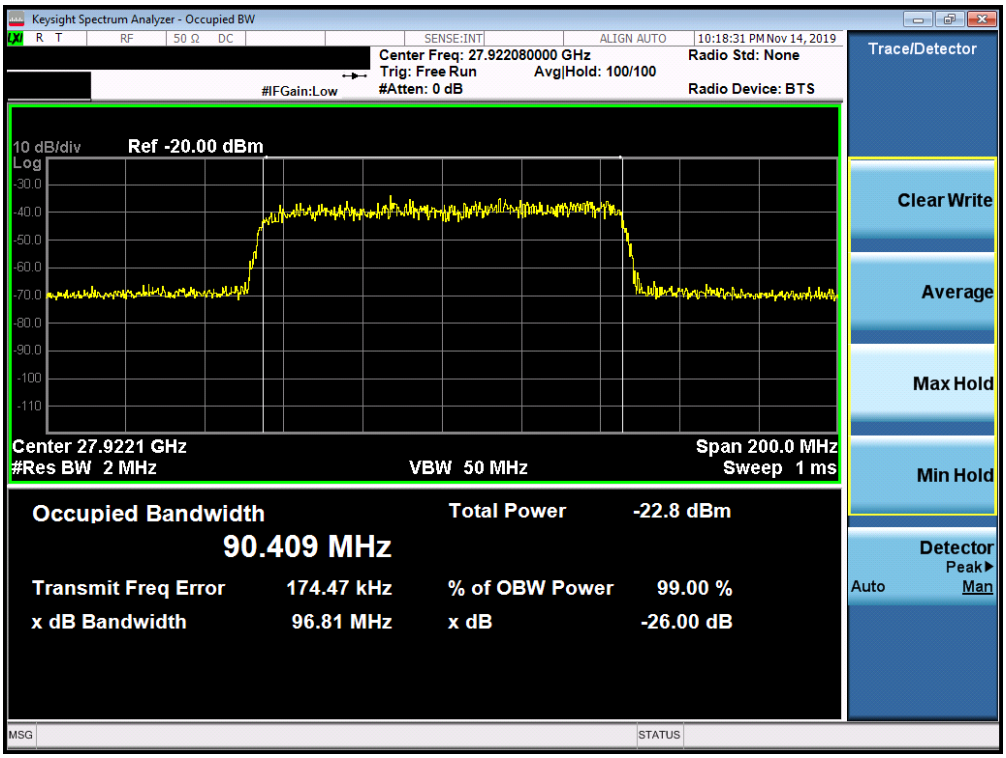
Plot 7-16. Ant2 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



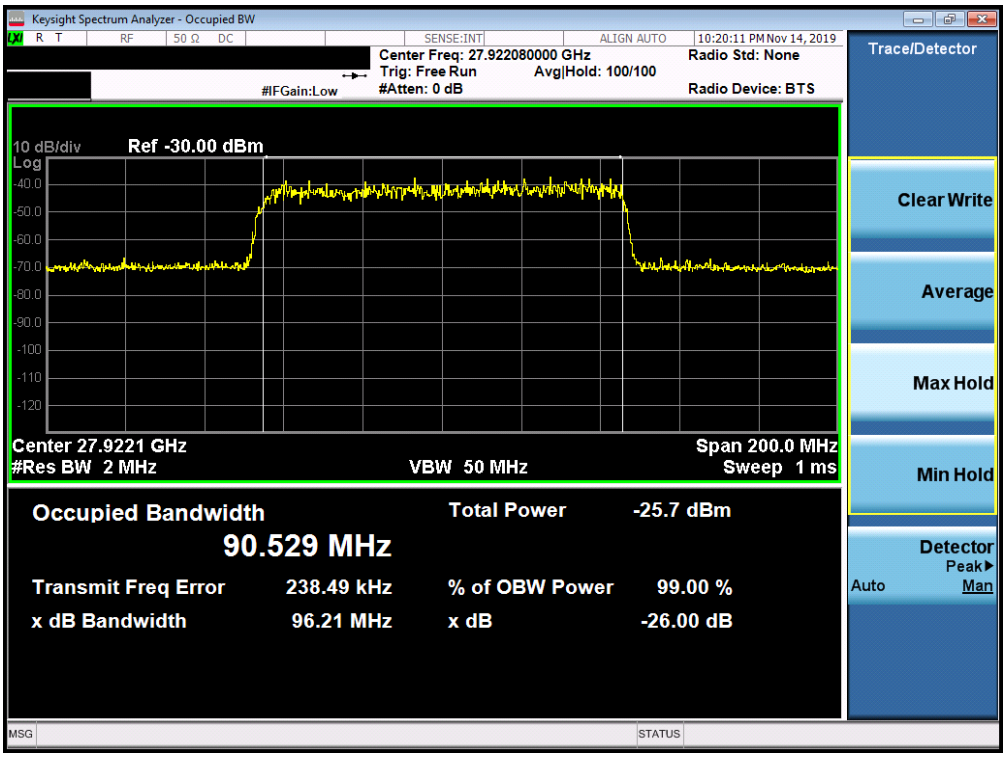
Plot 7-17. Ant2 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



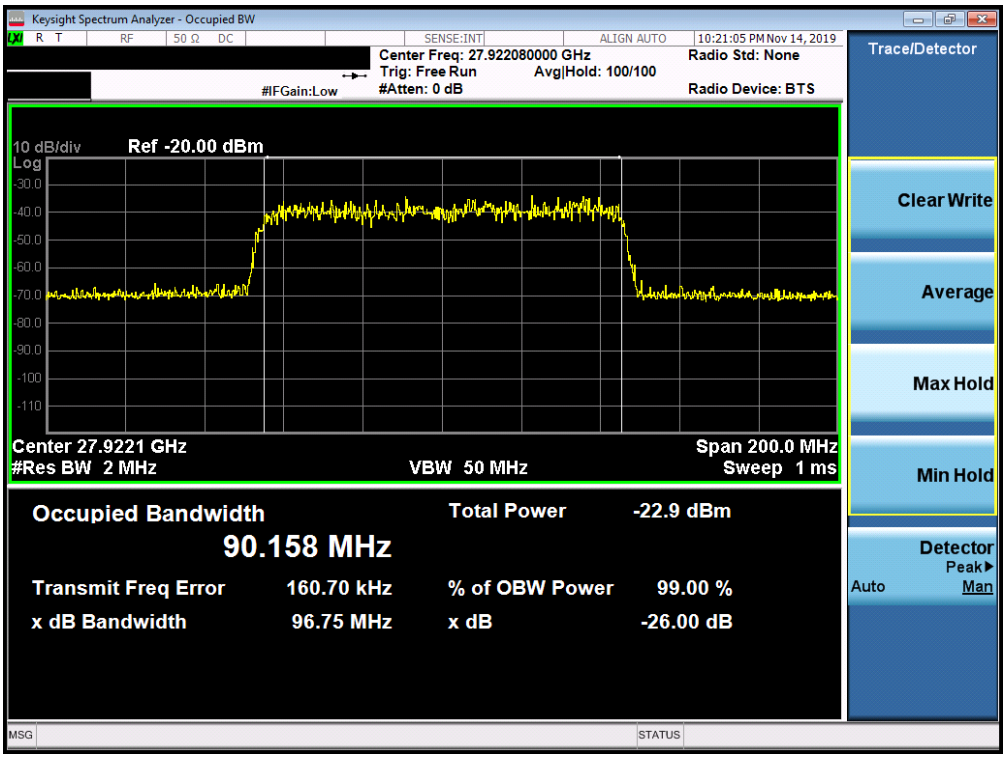
Plot 7-18. Ant2 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)



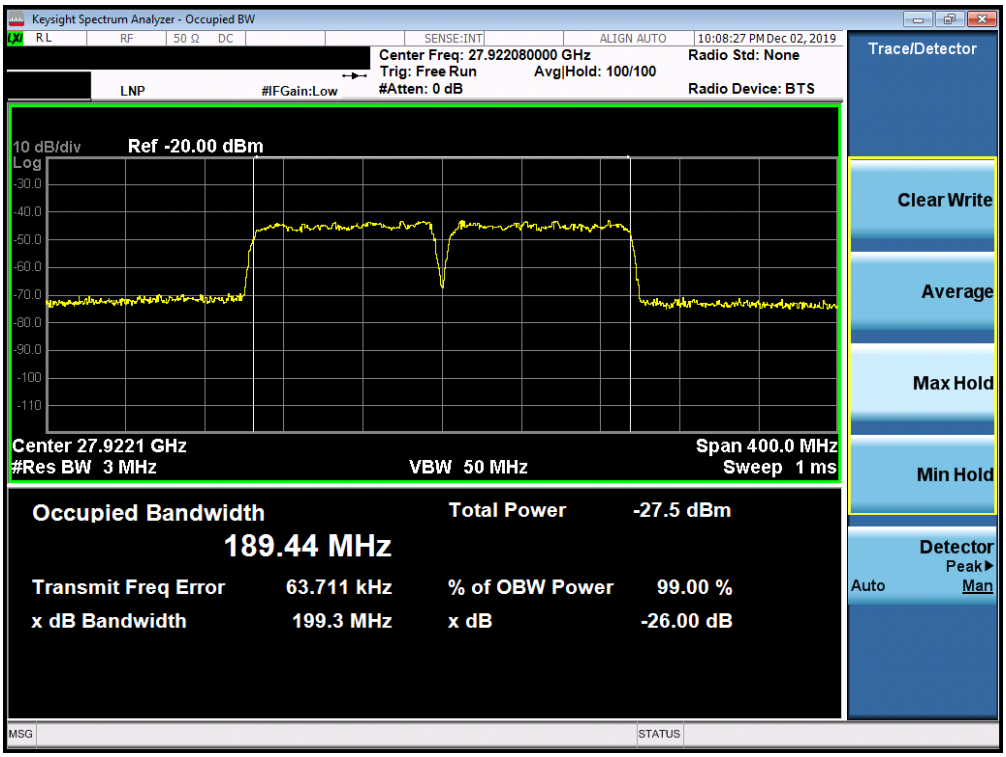
Plot 7-19. Ant2 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)



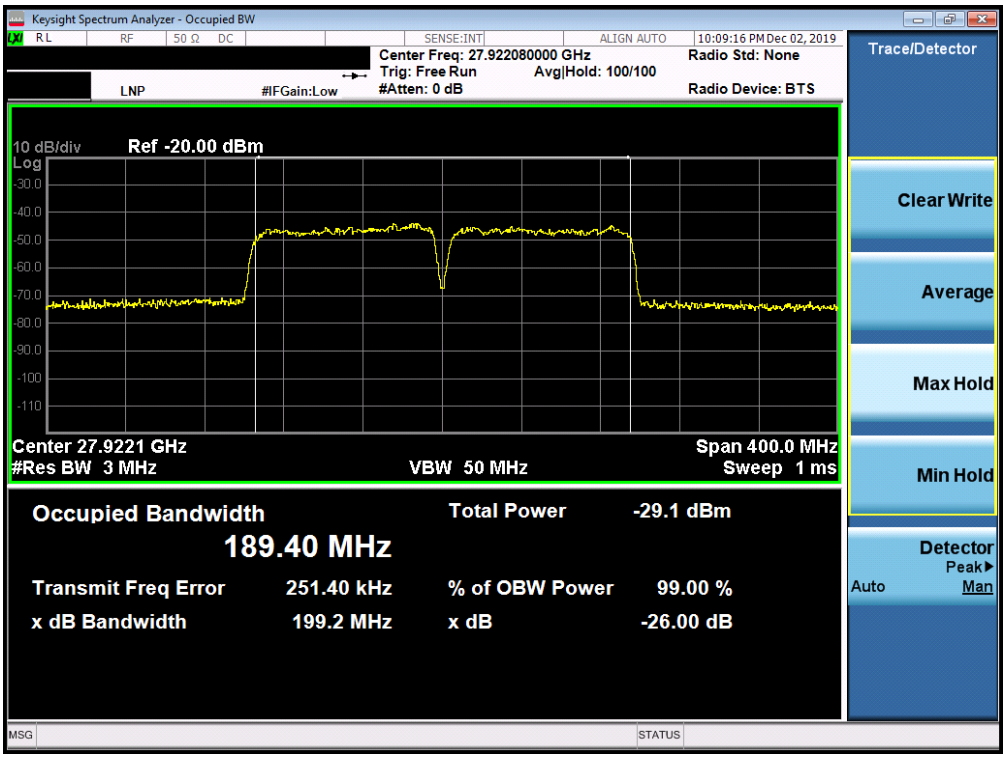
Plot 7-20. Ant2 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



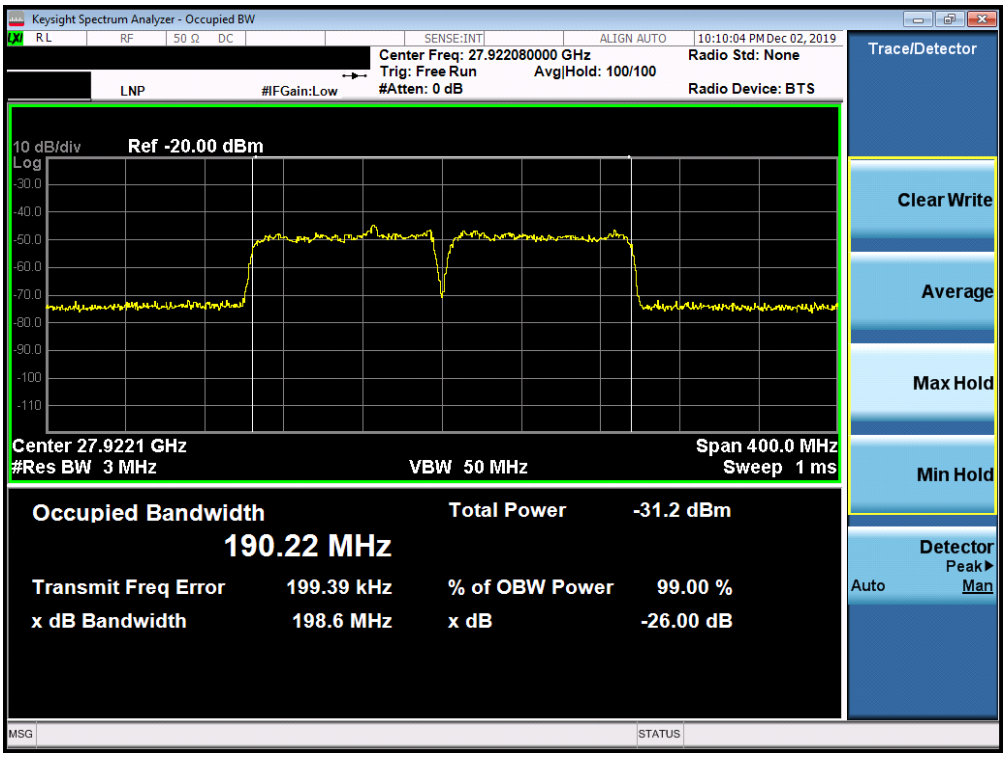
Plot 7-21. Ant2 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



Plot 7-22. Ant2 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)



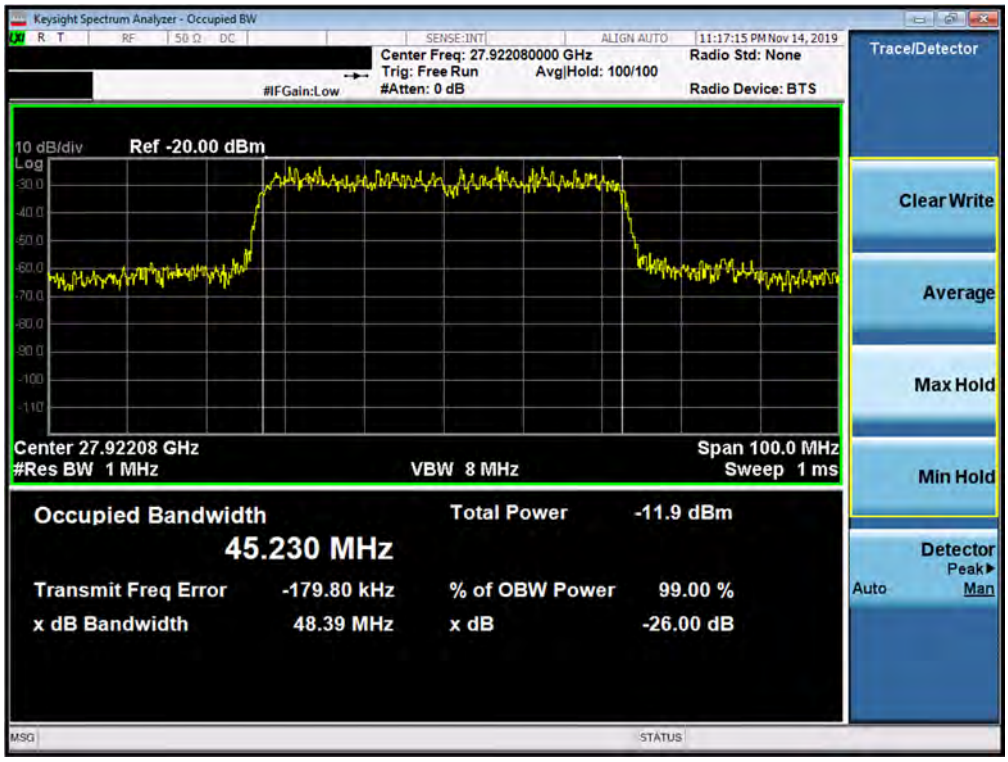
Plot 7-23. Ant2 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)



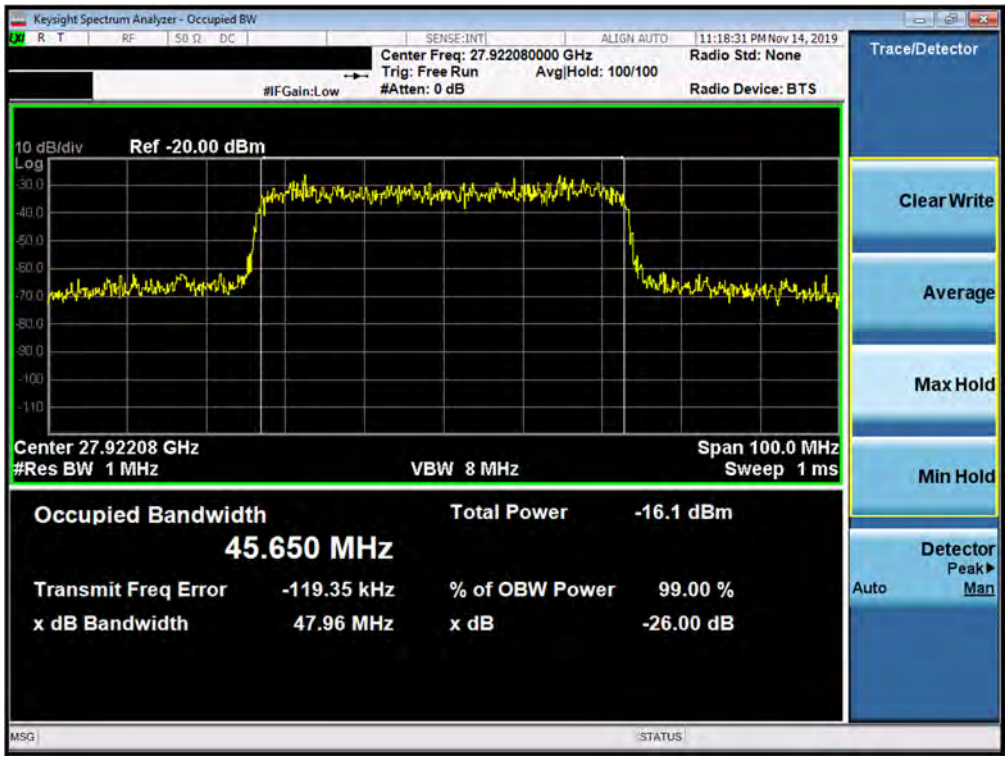
Plot 7-24. Ant2 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

Channel	Bandwidth	CCs Active	Modulation	OBW [MHz]
Mid	50	1	QPSK	45.23
			16QAM	45.65
			64QAM	45.41
		2	QPSK	94.79
			16QAM	94.58
			64QAM	94.86
	100	1	QPSK	90.72
			16QAM	90.50
			64QAM	90.19
		2	QPSK	189.68
			16QAM	188.79
			64QAM	189.42

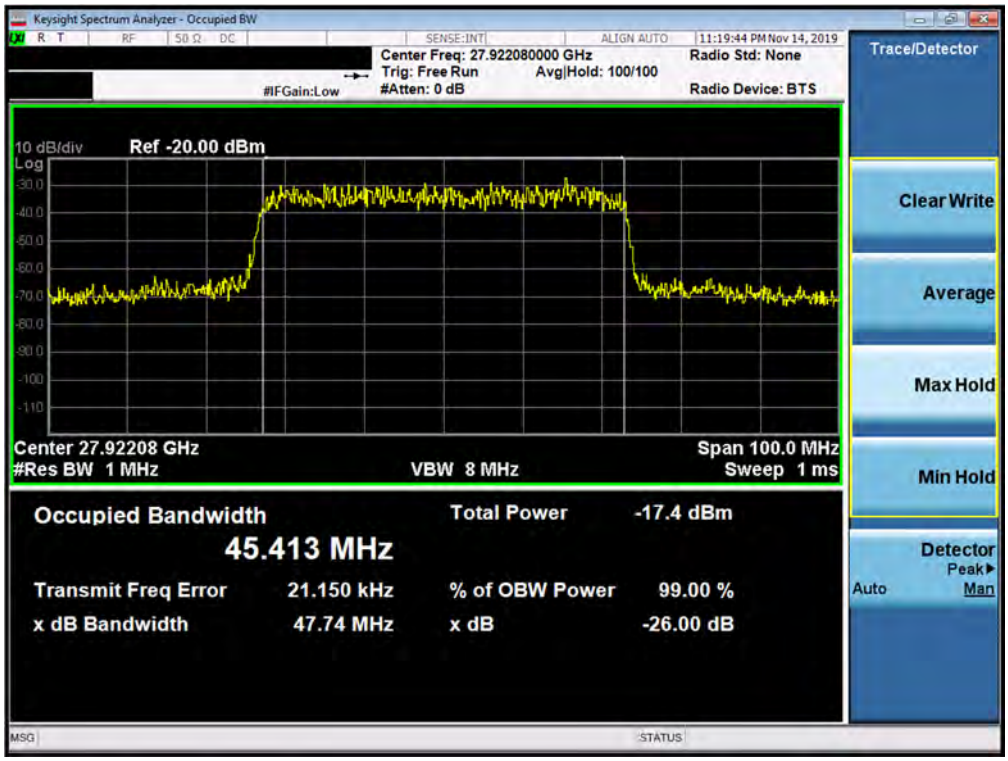
Table 7-4. Summary of Ant3 Occupied Bandwidths (n261)



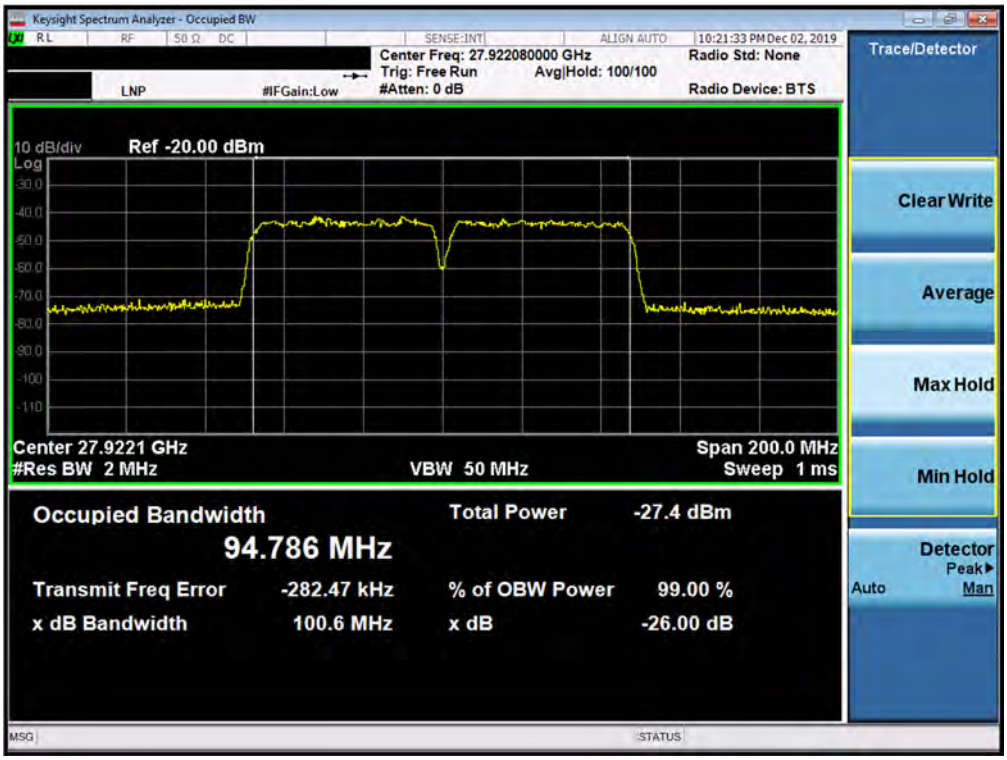
Plot 7-25. Ant3 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)



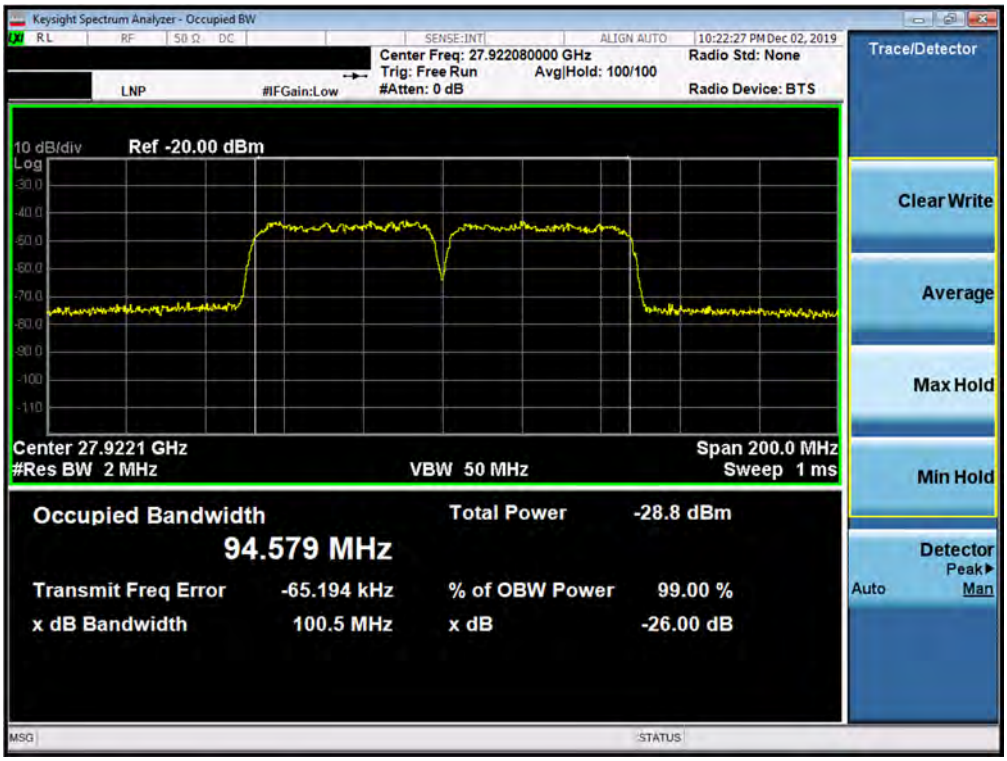
Plot 7-26. Ant3 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



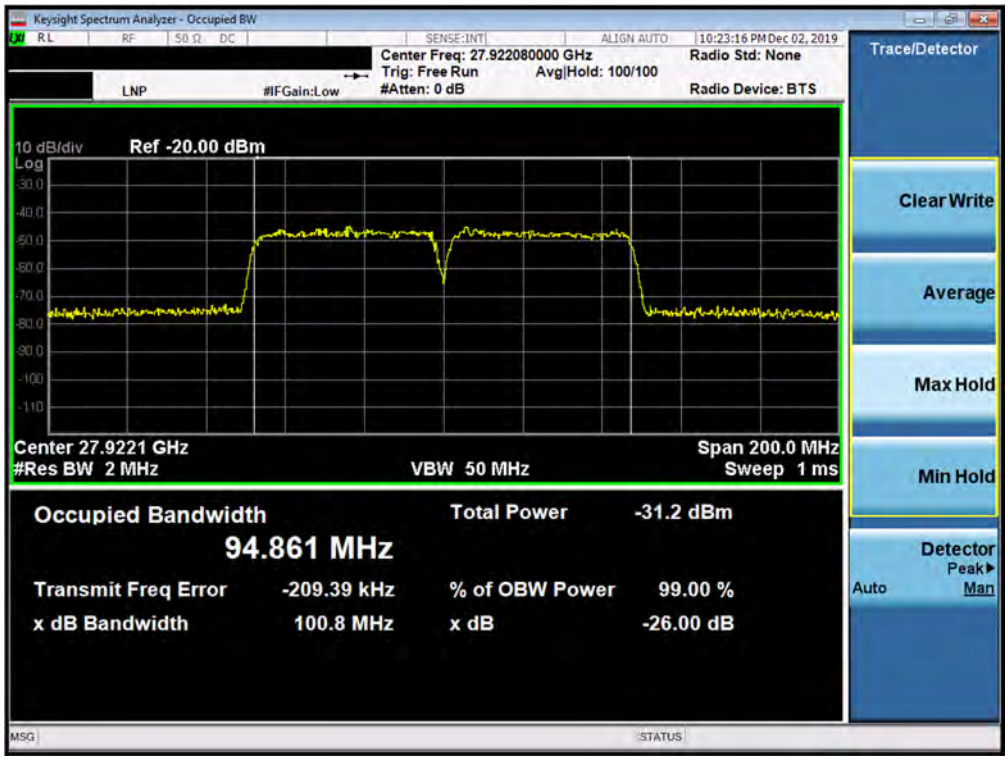
Plot 7-27. Ant3 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



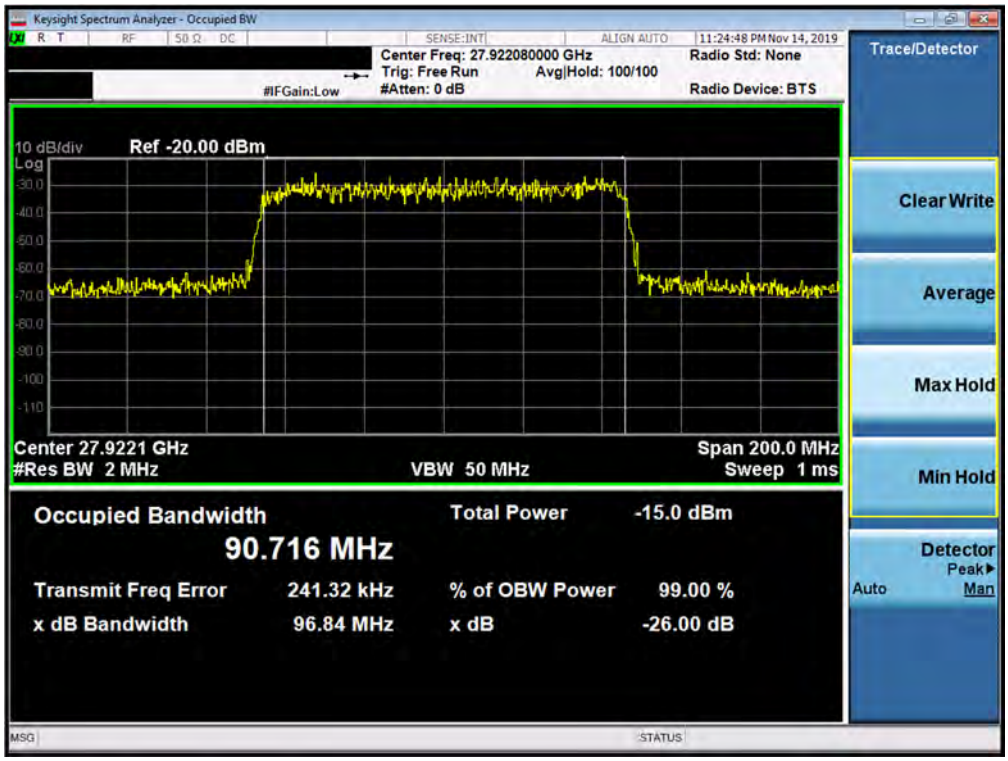
Plot 7-28. Ant3 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



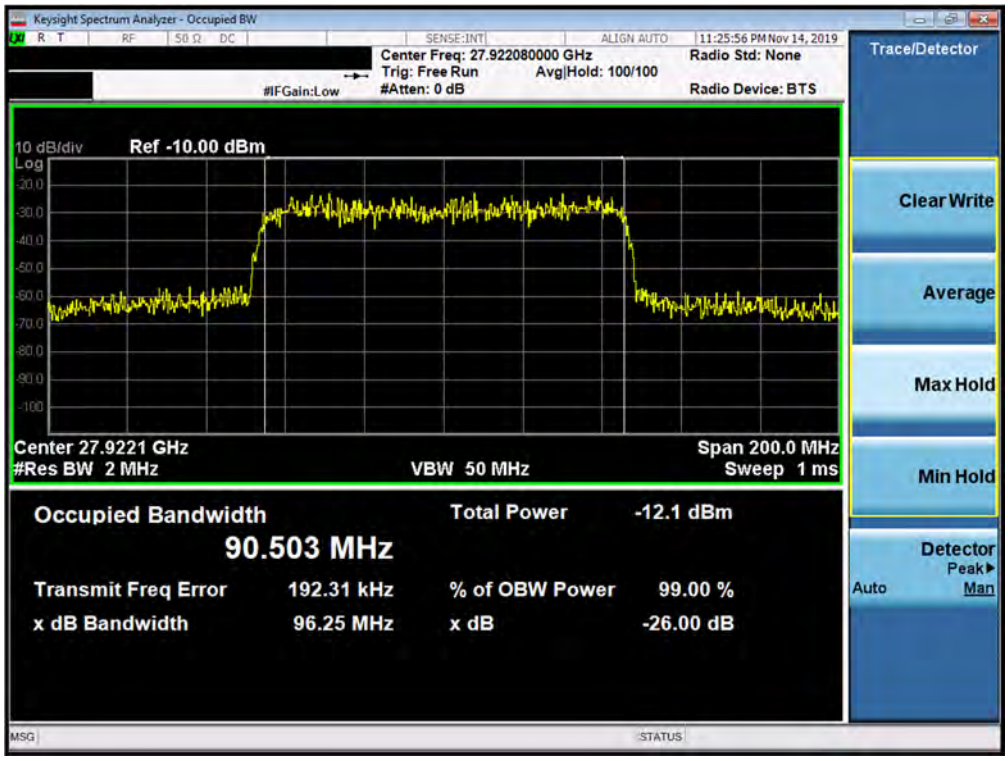
Plot 7-29. Ant3 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



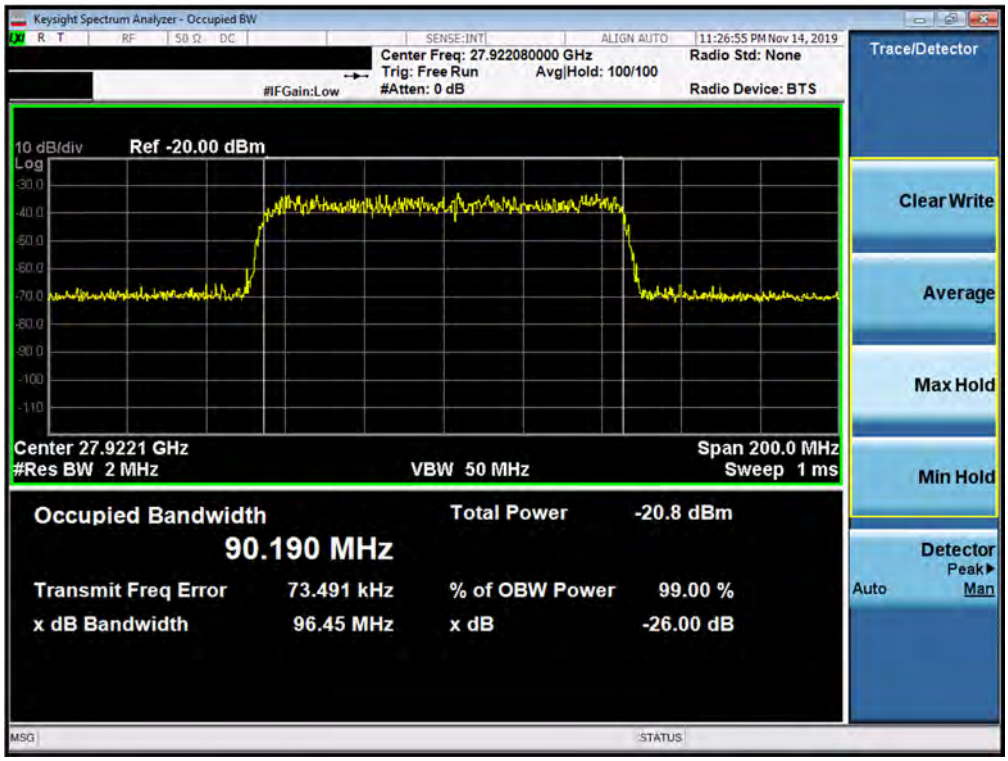
Plot 7-30. Ant3 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)



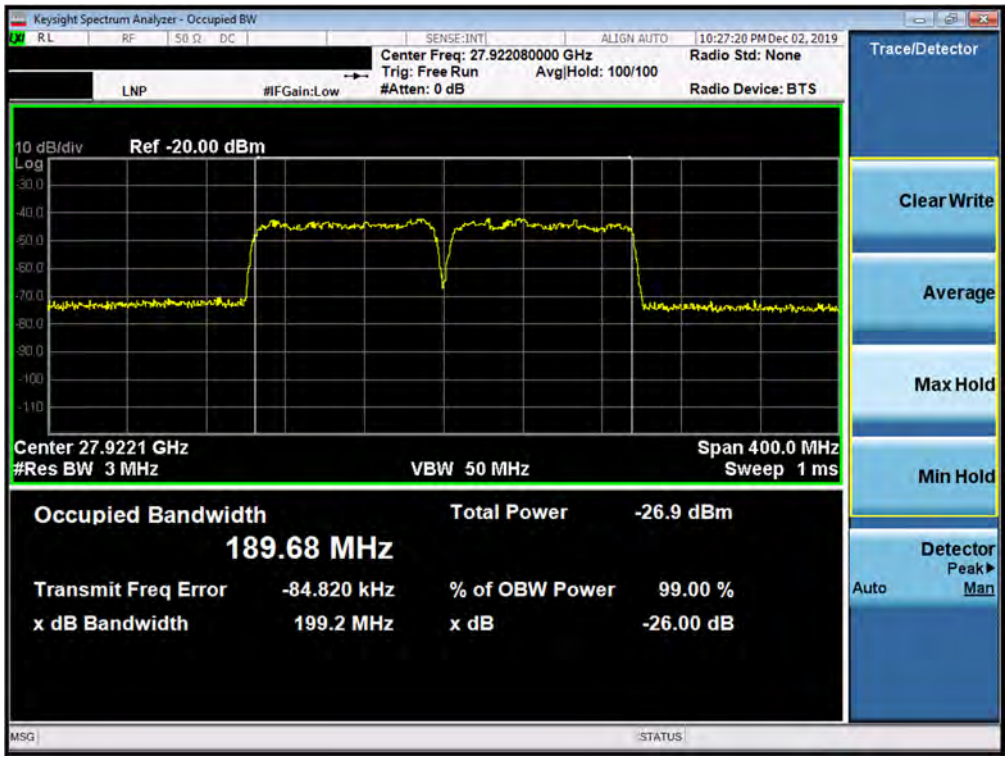
Plot 7-31. Ant3 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)



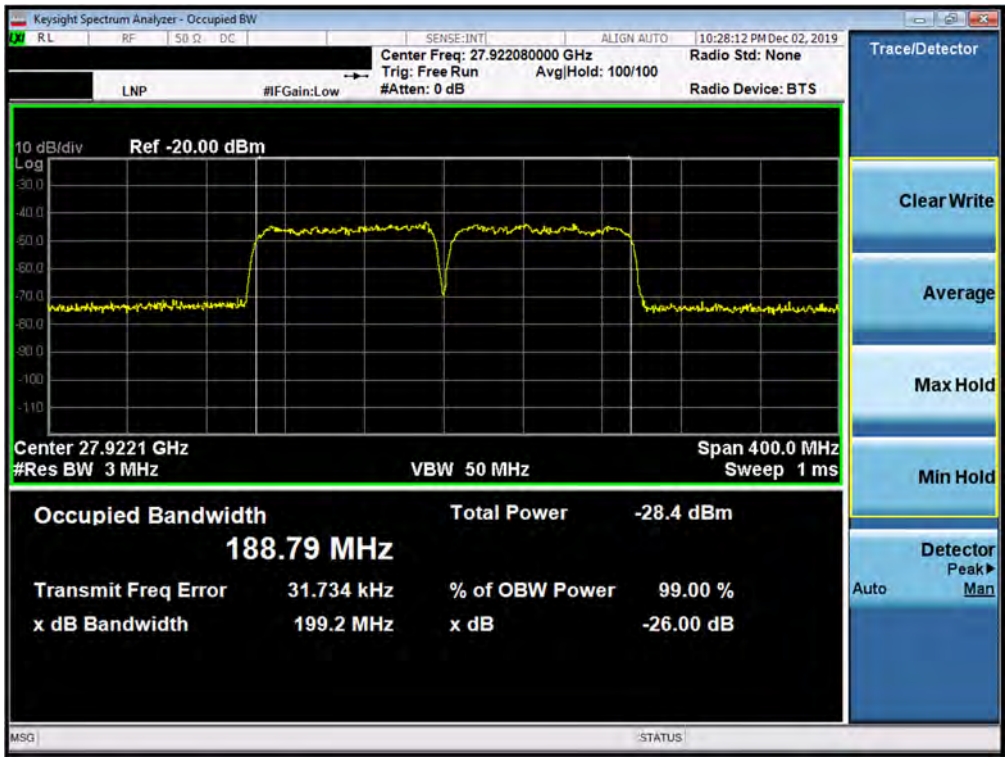
Plot 7-32. Ant3 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



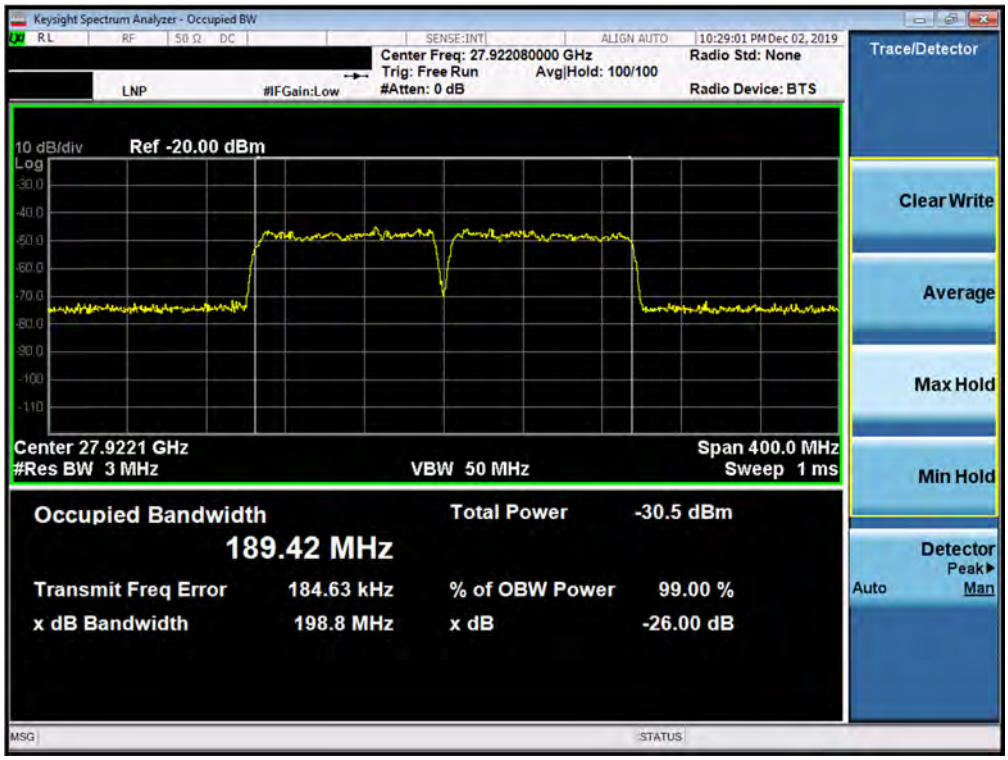
Plot 7-33. Ant3 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



Plot 7-34. Ant3 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)



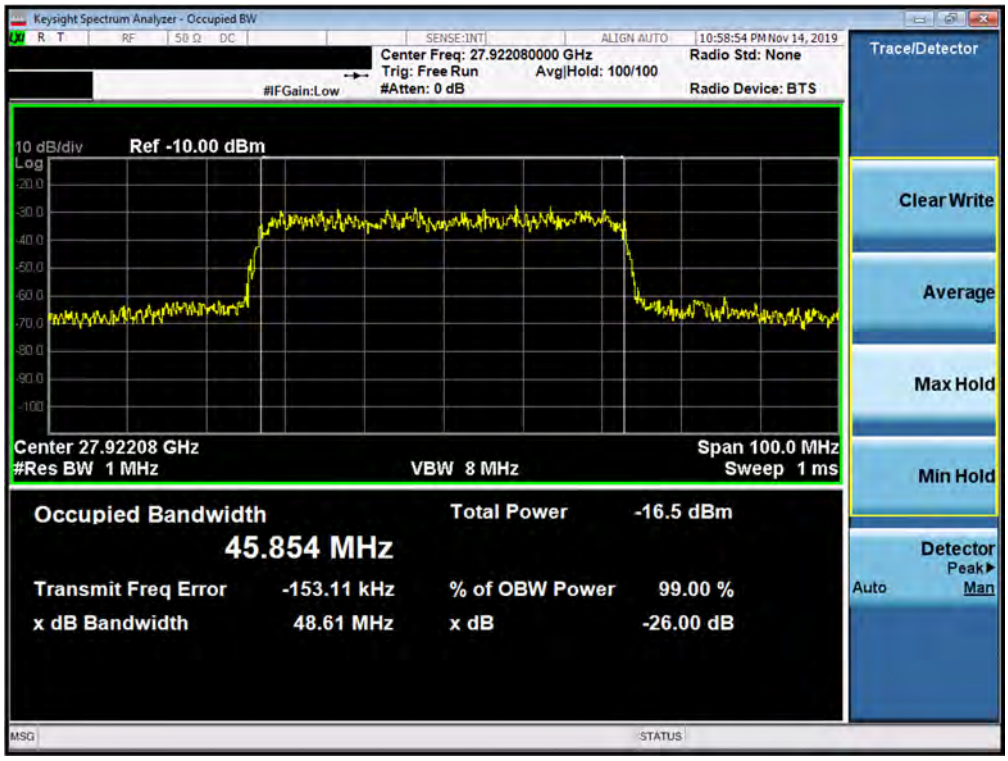
Plot 7-35. Ant3 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)



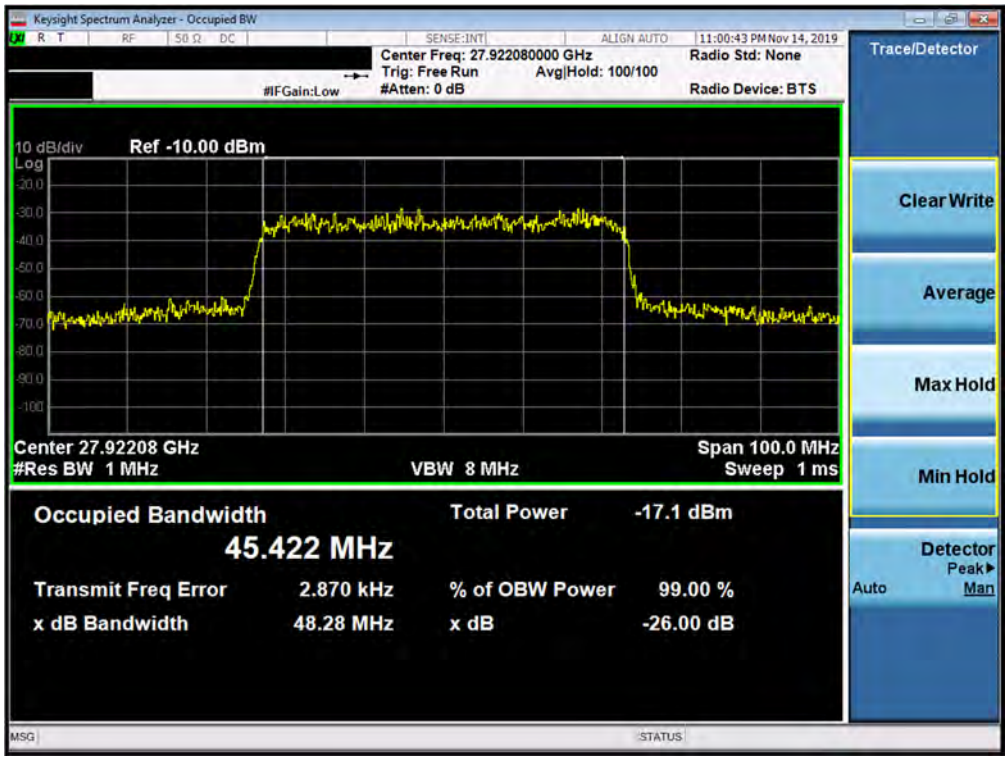
Plot 7-36. Ant3 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

Channel	Bandwidth	CCs Active	Modulation	OBW [MHz]
Mid	50	1	QPSK	45.85
			16QAM	45.42
			64QAM	45.20
		2	QPSK	94.83
			16QAM	94.53
			64QAM	94.49
	100	1	QPSK	90.69
			16QAM	90.67
			64QAM	90.54
		2	QPSK	188.79
			16QAM	189.32
			64QAM	188.90

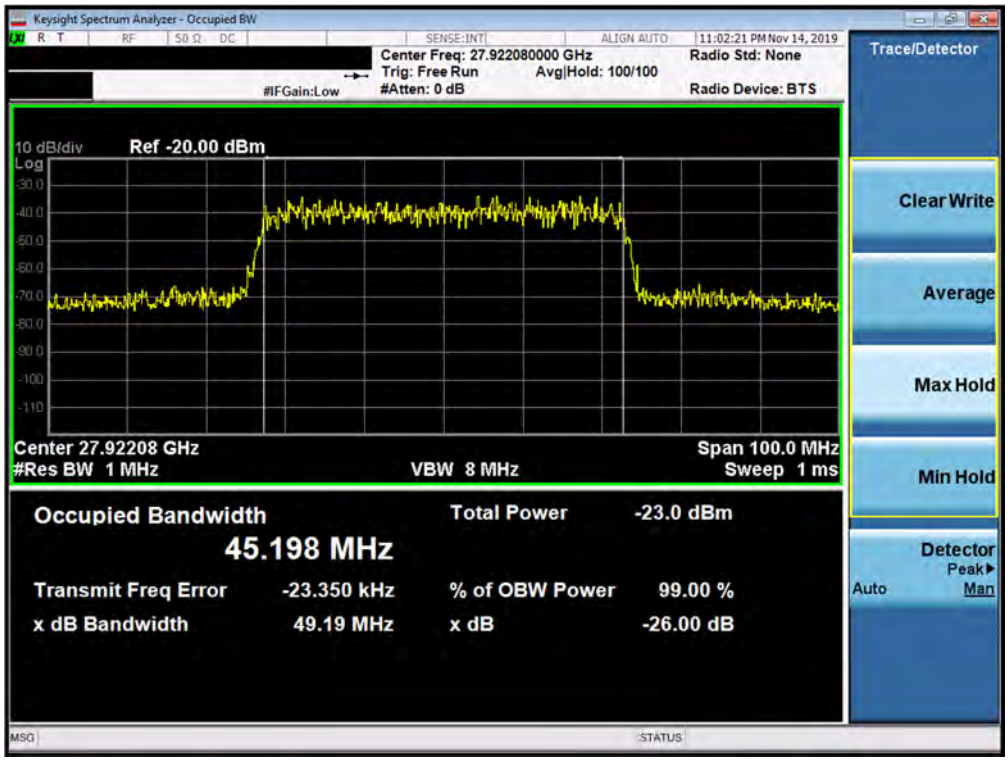
Table 7-5. Summary of Ant4 Occupied Bandwidths (n261)



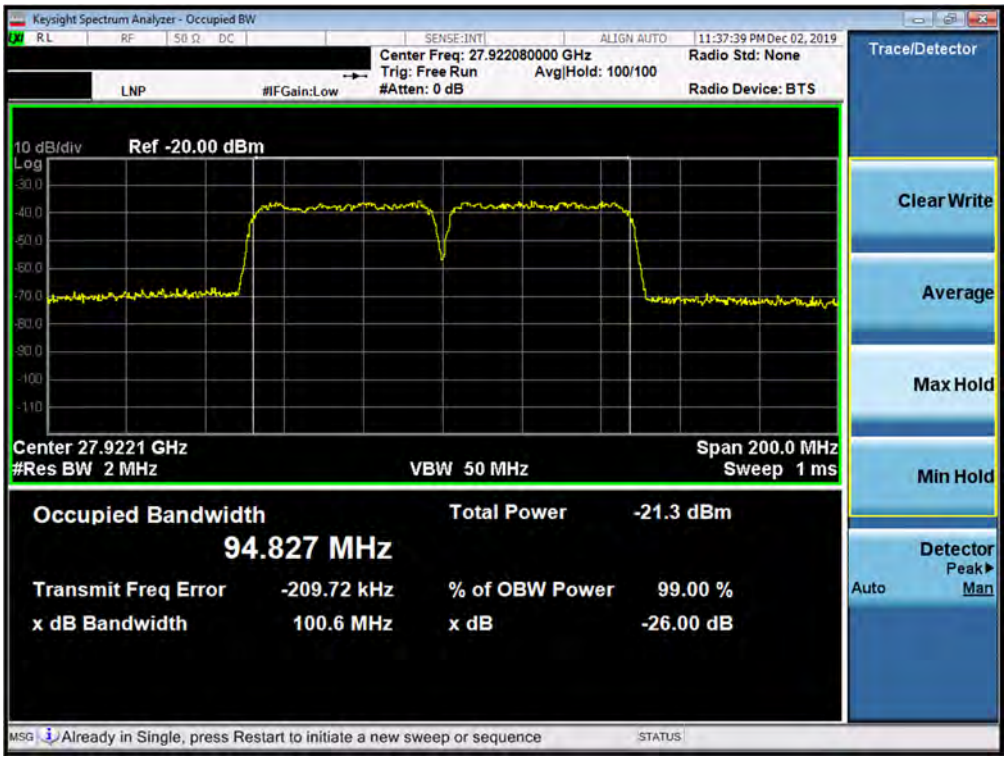
Plot 7-37. Ant4 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)



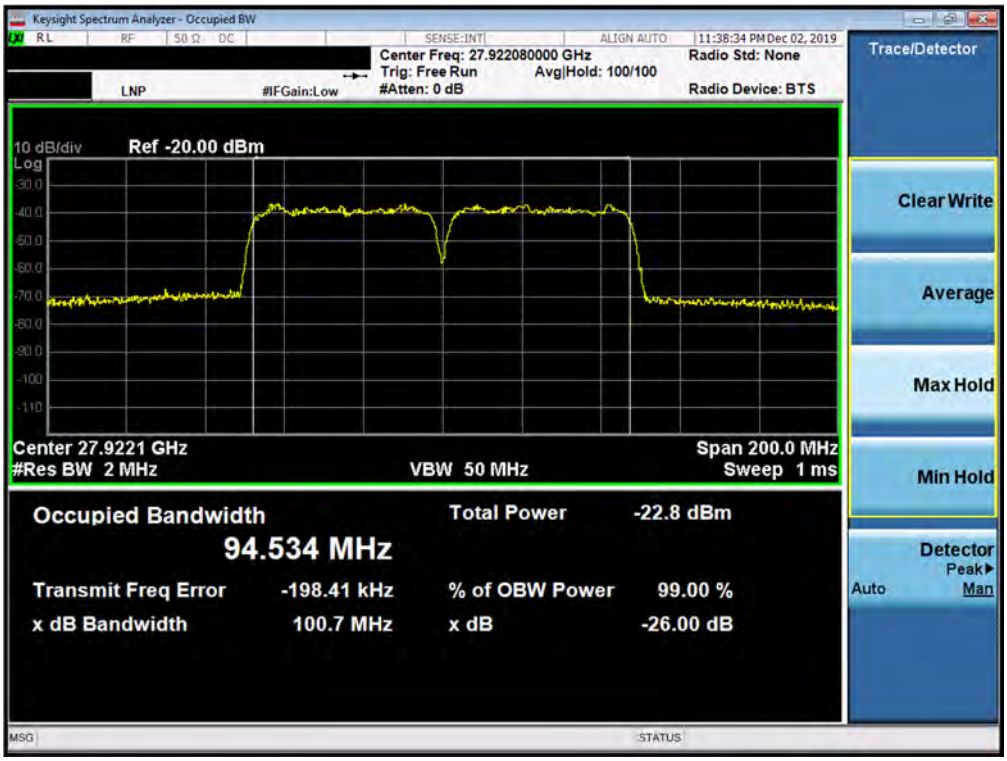
Plot 7-38. Ant4 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



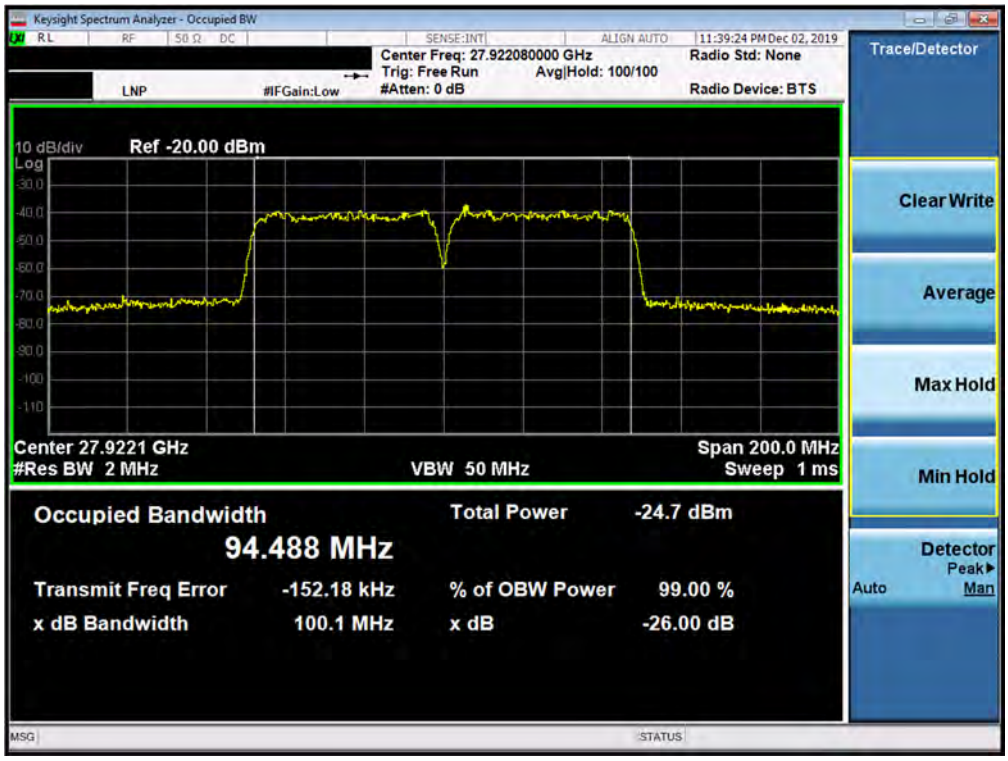
Plot 7-39. Ant4 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



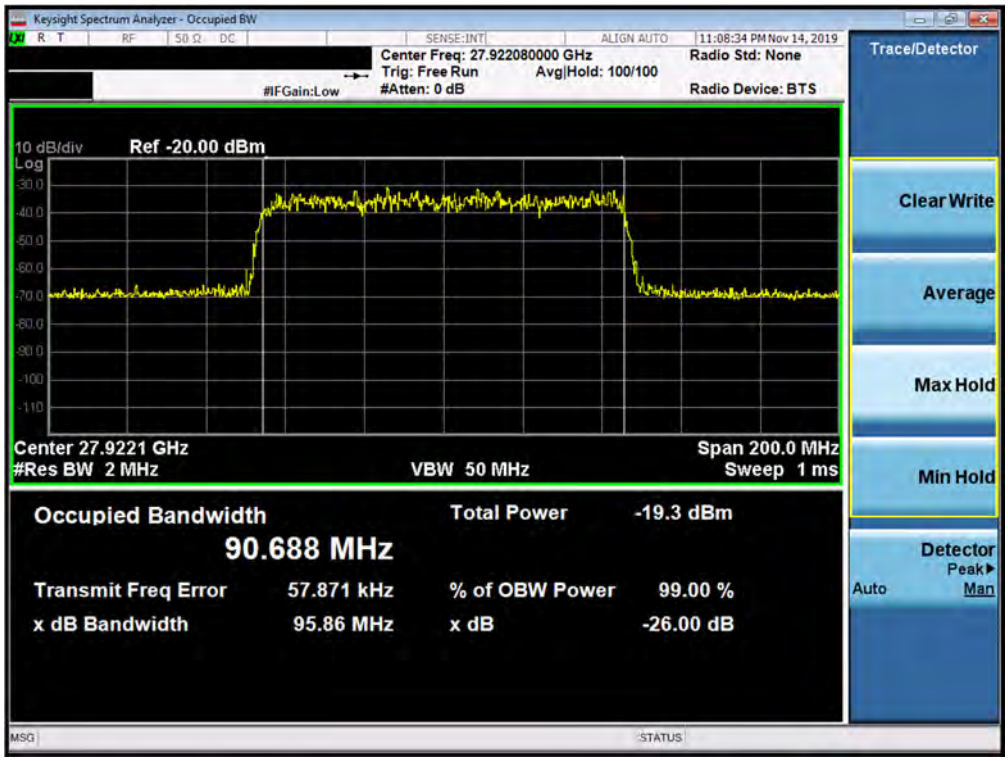
Plot 7-40. Ant4 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



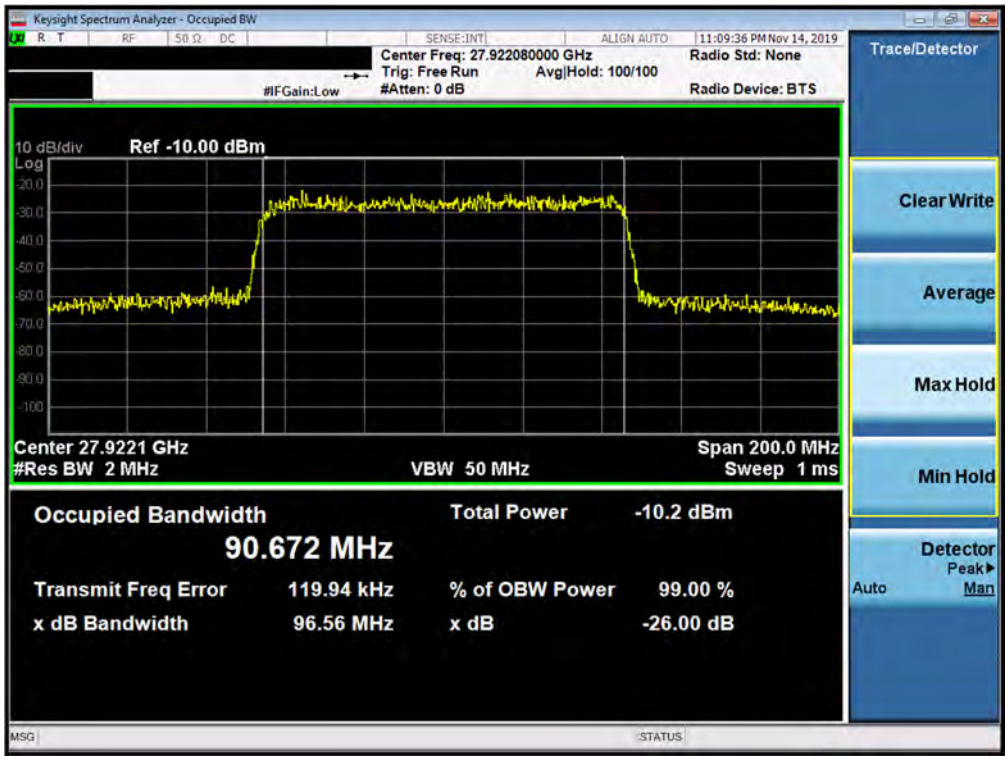
Plot 7-41. Ant4 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



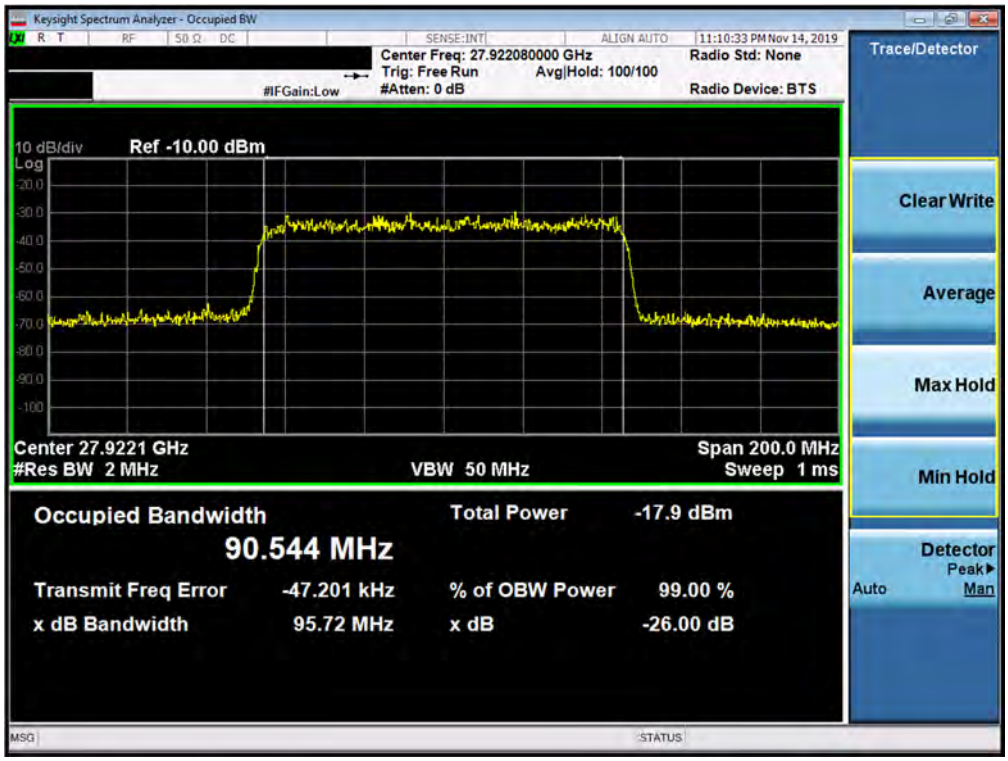
Plot 7-42. Ant4 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)



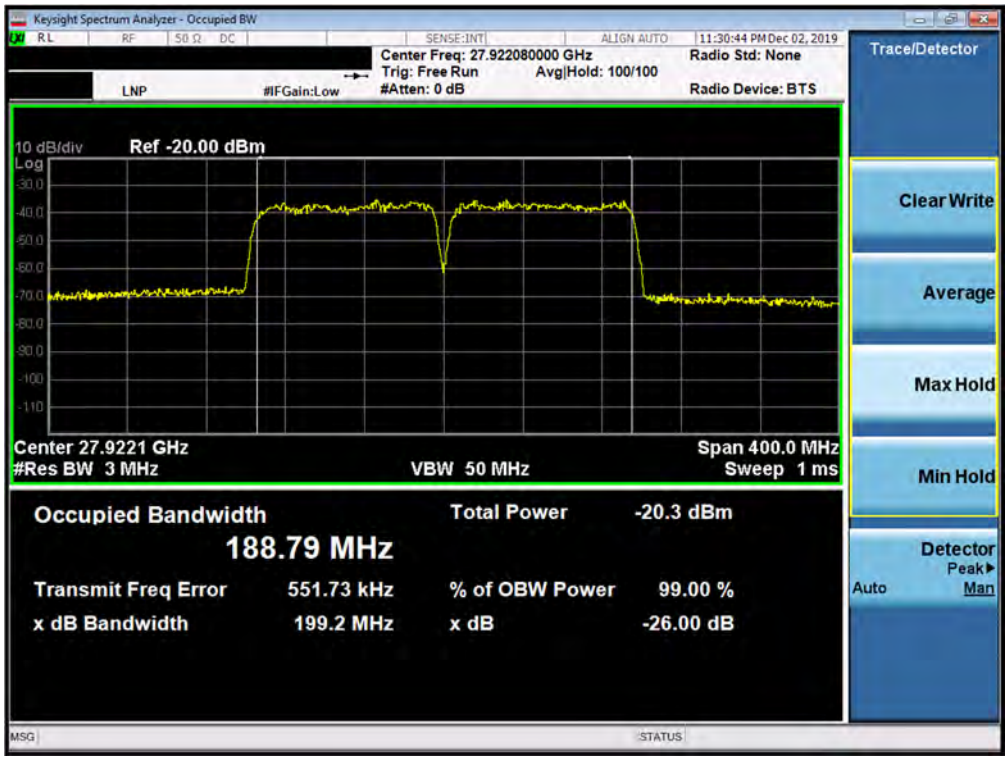
Plot 7-43. Ant4 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)



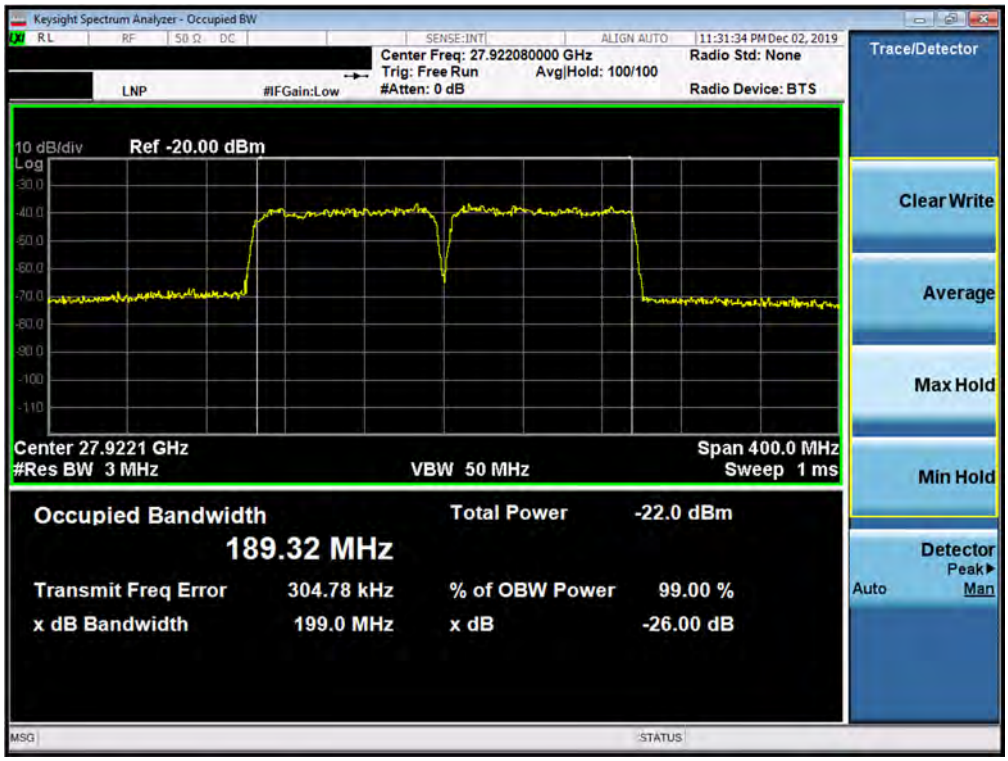
Plot 7-44. Ant4 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



Plot 7-45. Ant4 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



Plot 7-46. Ant4 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)



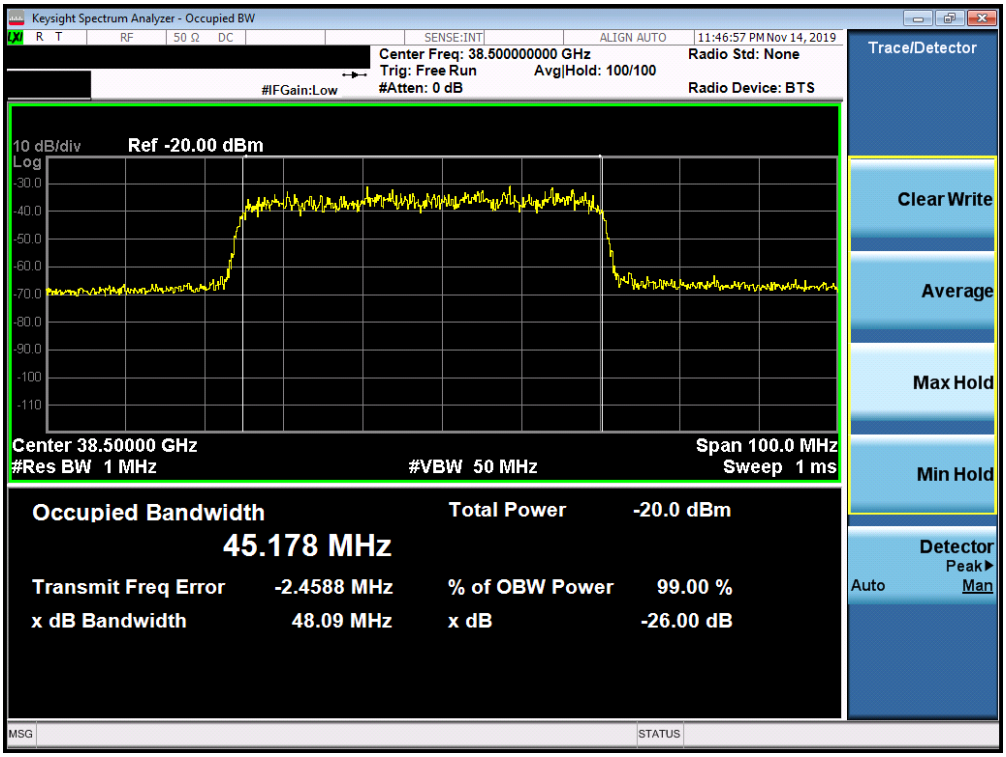
Plot 7-47. Ant4 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)

Plot 7-48. Ant4 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

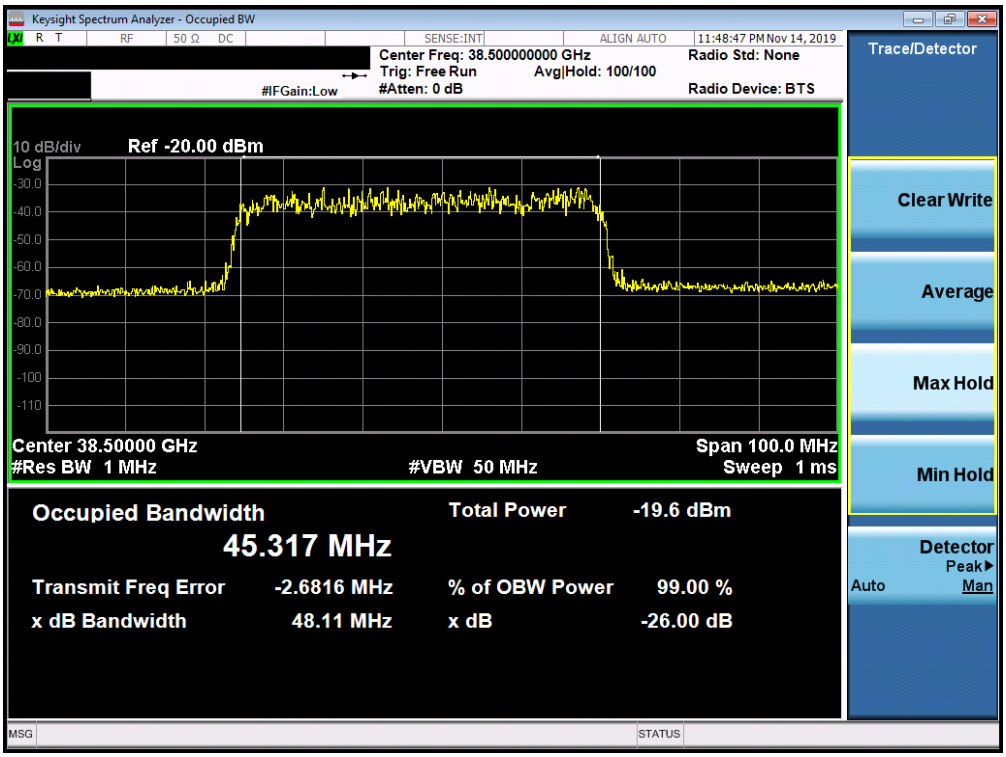
Band n260

Channel	Bandwidth	CCs Active	Modulation	OBW [MHz]
Mid	50	1	QPSK	45.18
			16QAM	45.32
			64QAM	45.58
		2	QPSK	94.80
			16QAM	94.79
			64QAM	94.83
	100	1	QPSK	90.85
			16QAM	90.57
			64QAM	90.76
		2	QPSK	189.25
			16QAM	189.45
			64QAM	189.95

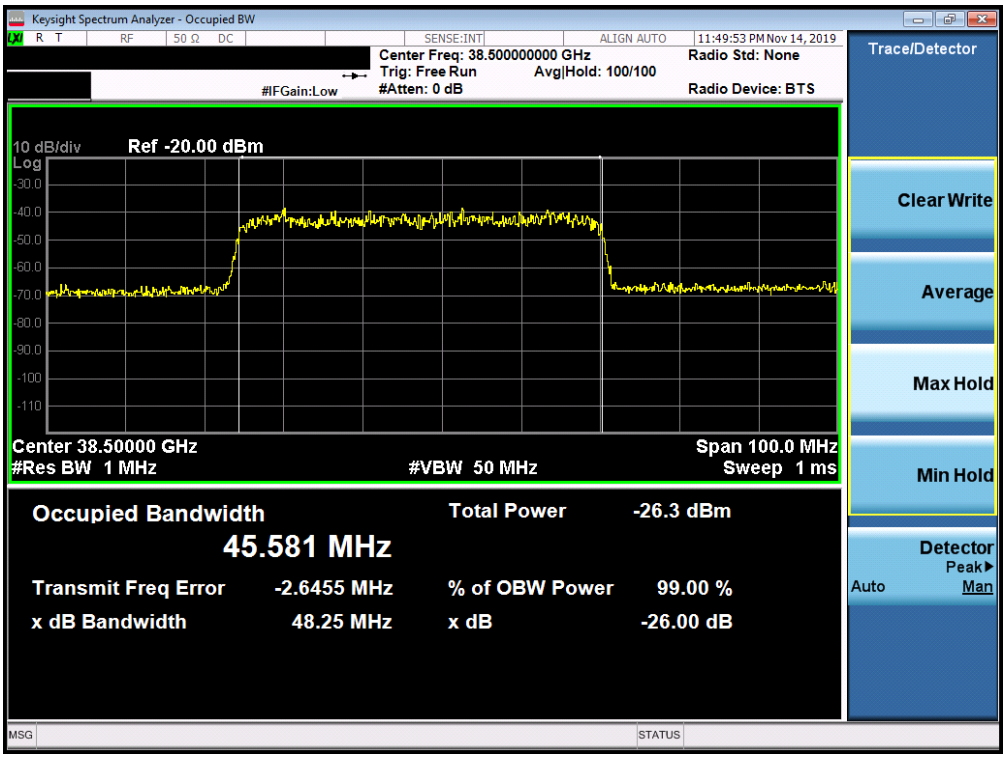
Table 7-6. Summary of Ant1 Occupied Bandwidths (n260)



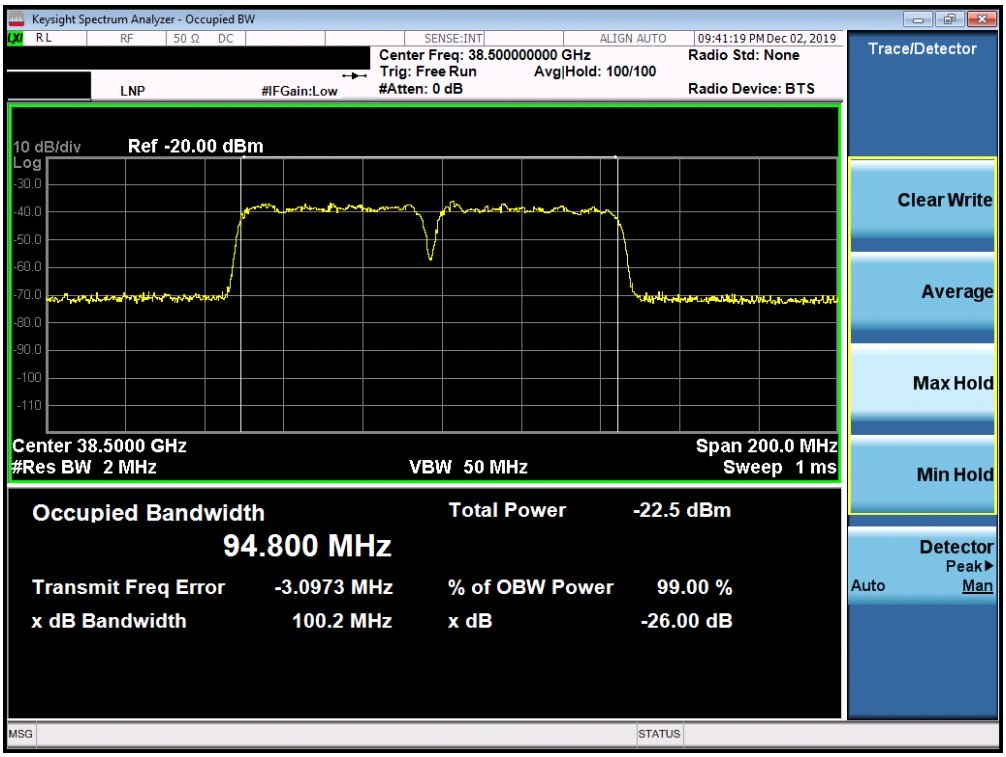
Plot 7-49. Ant1 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)



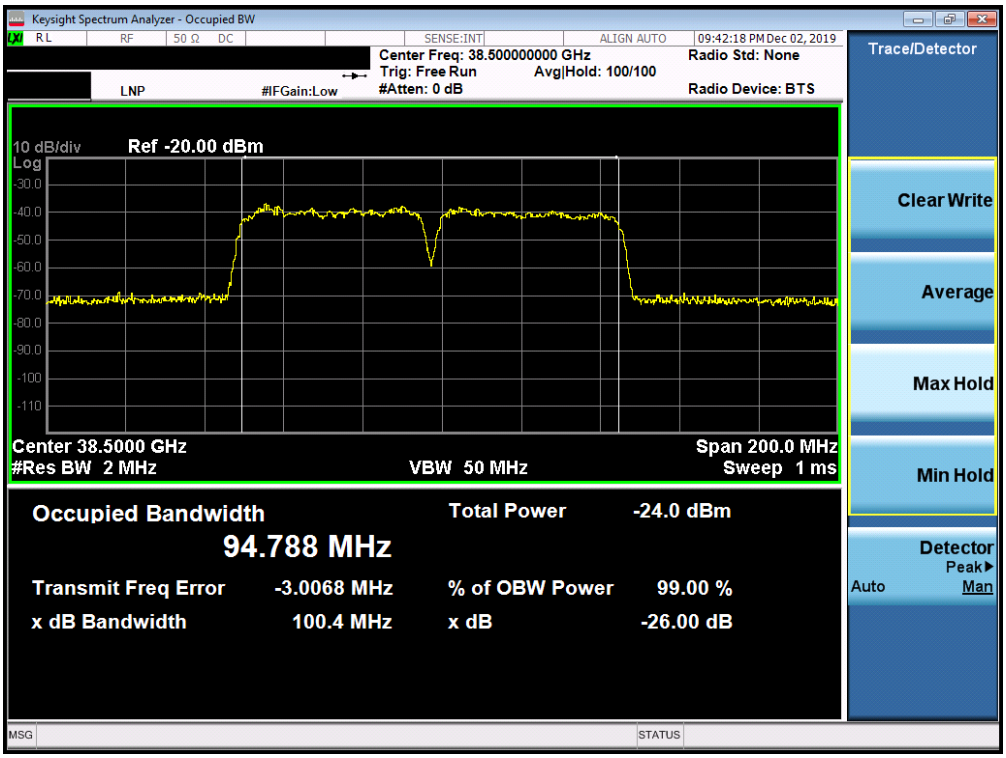
Plot 7-50. Ant1 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



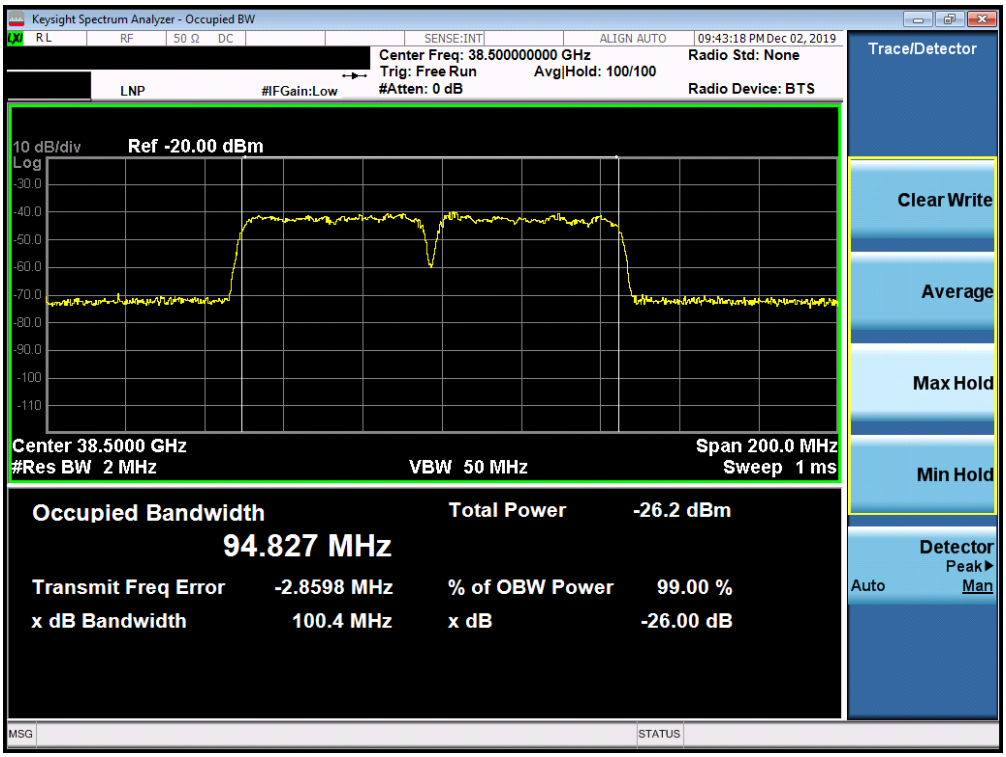
Plot 7-51. Ant1 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



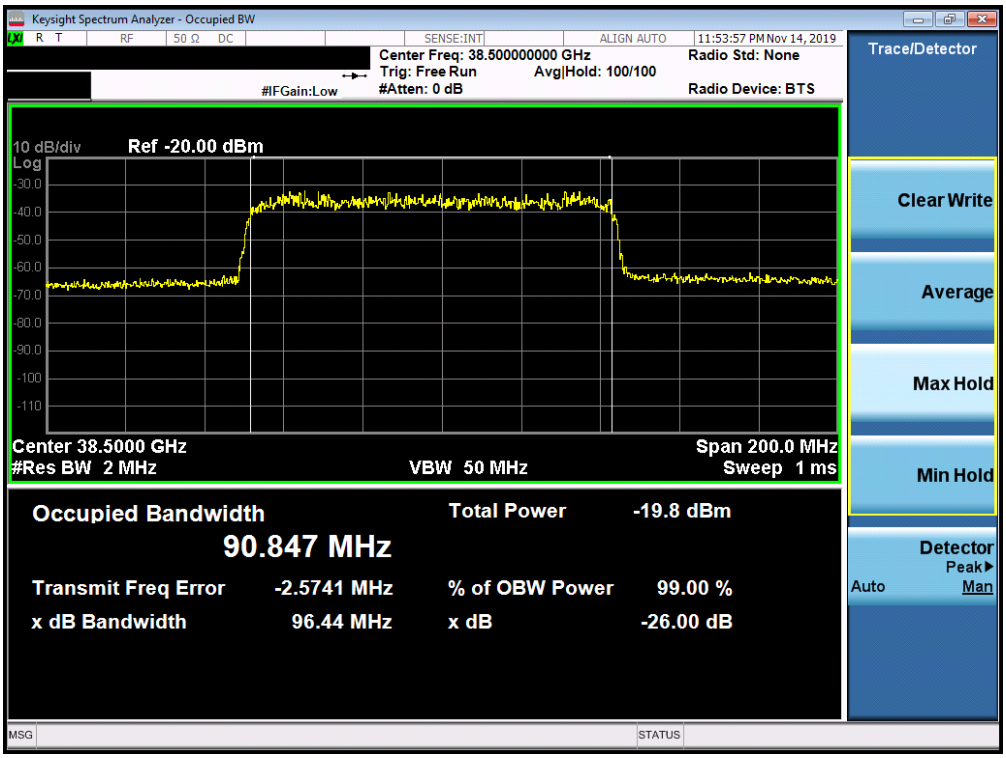
Plot 7-52. Ant1 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



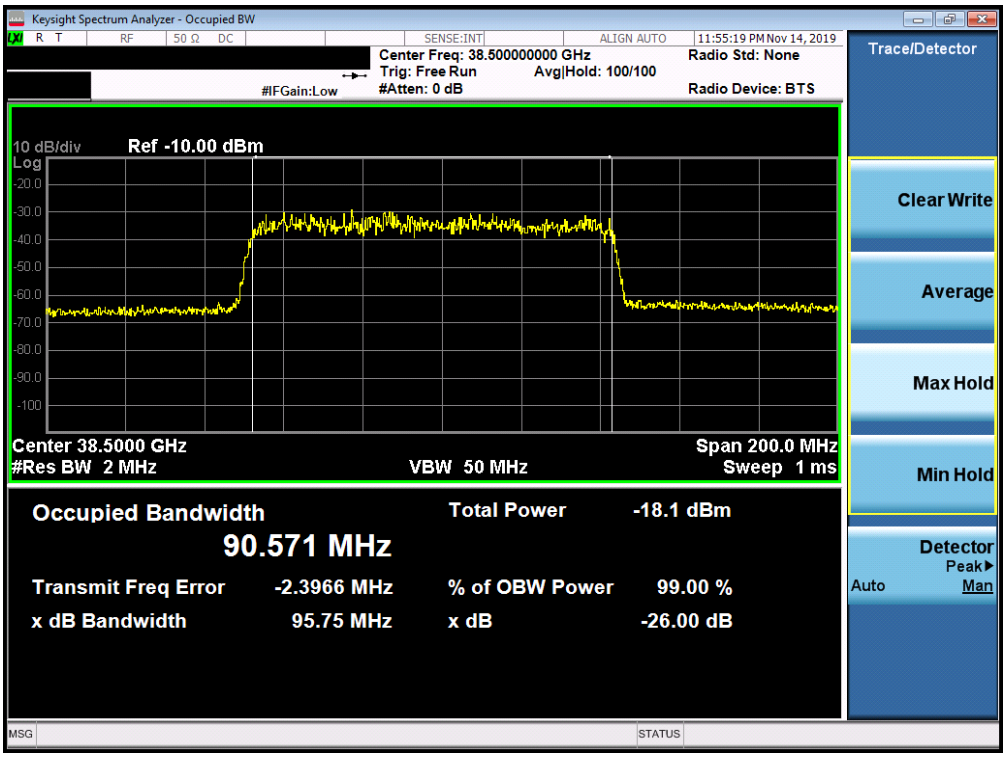
Plot 7-53. Ant1 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



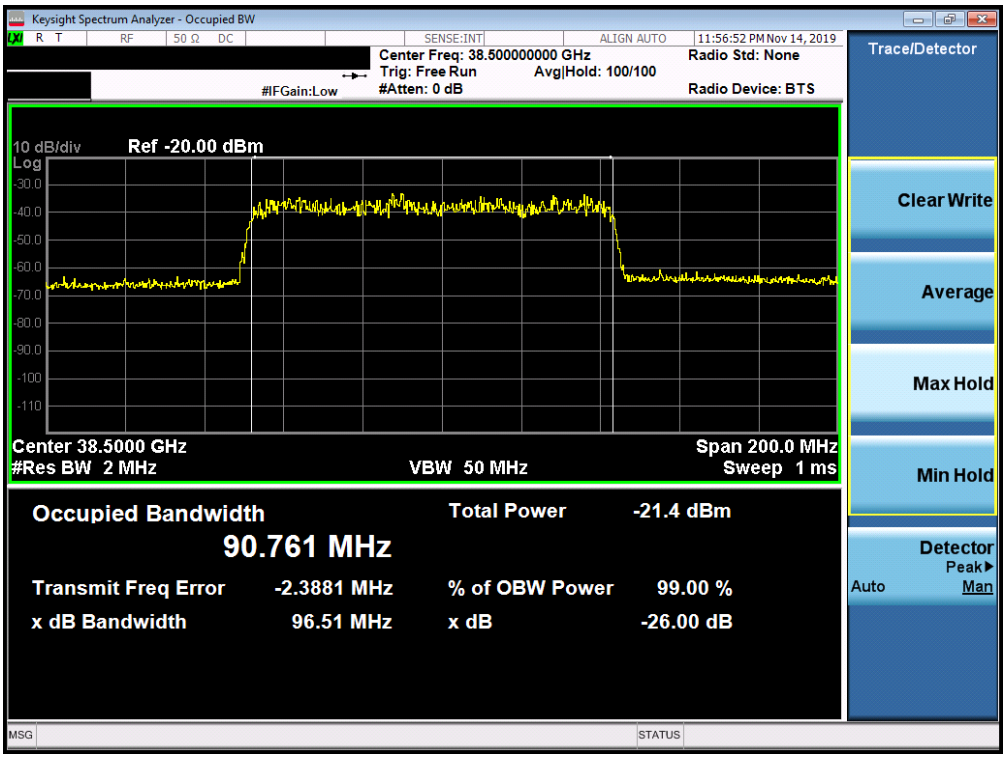
Plot 7-54. Ant1 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)



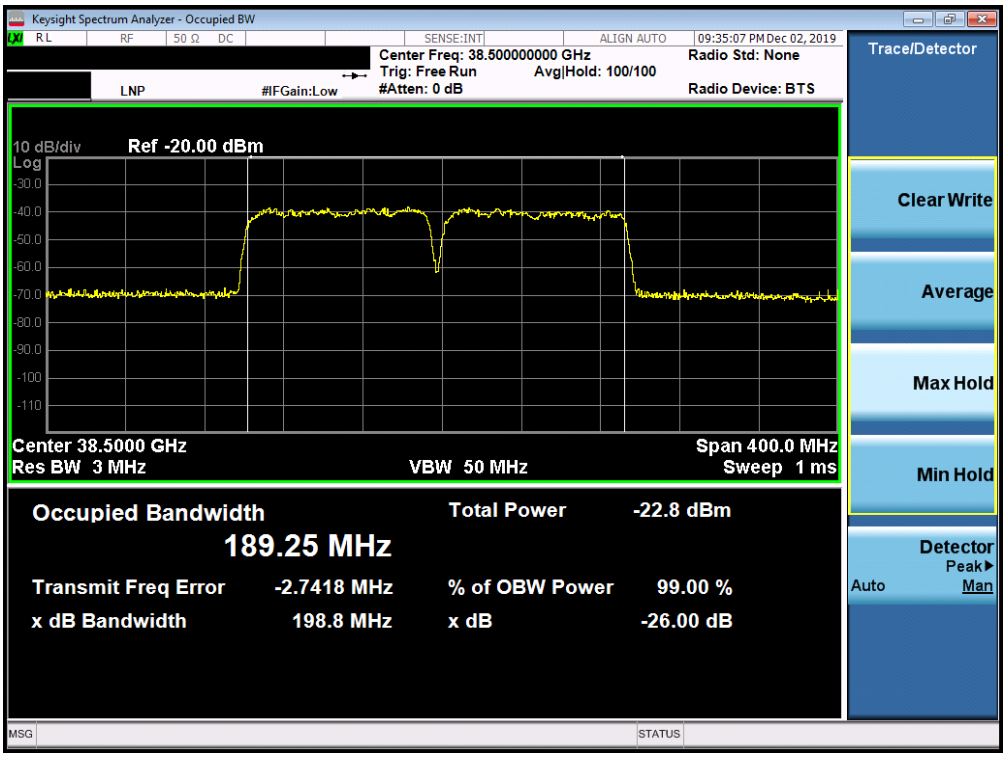
Plot 7-55. Ant1 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)



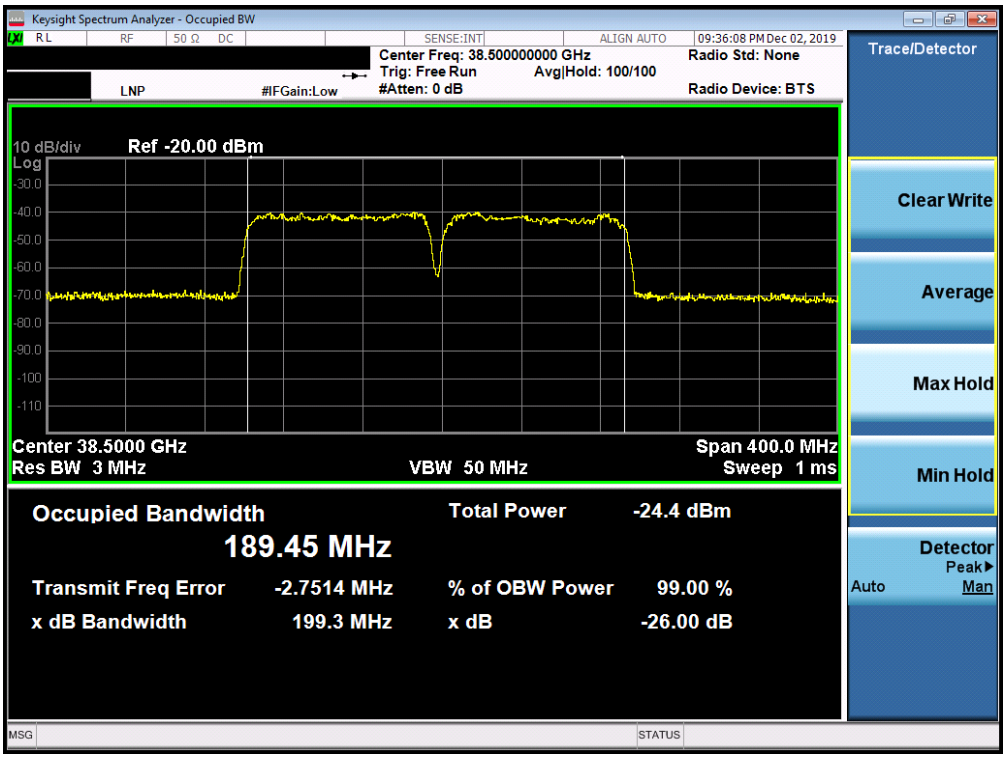
Plot 7-56. Ant1 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



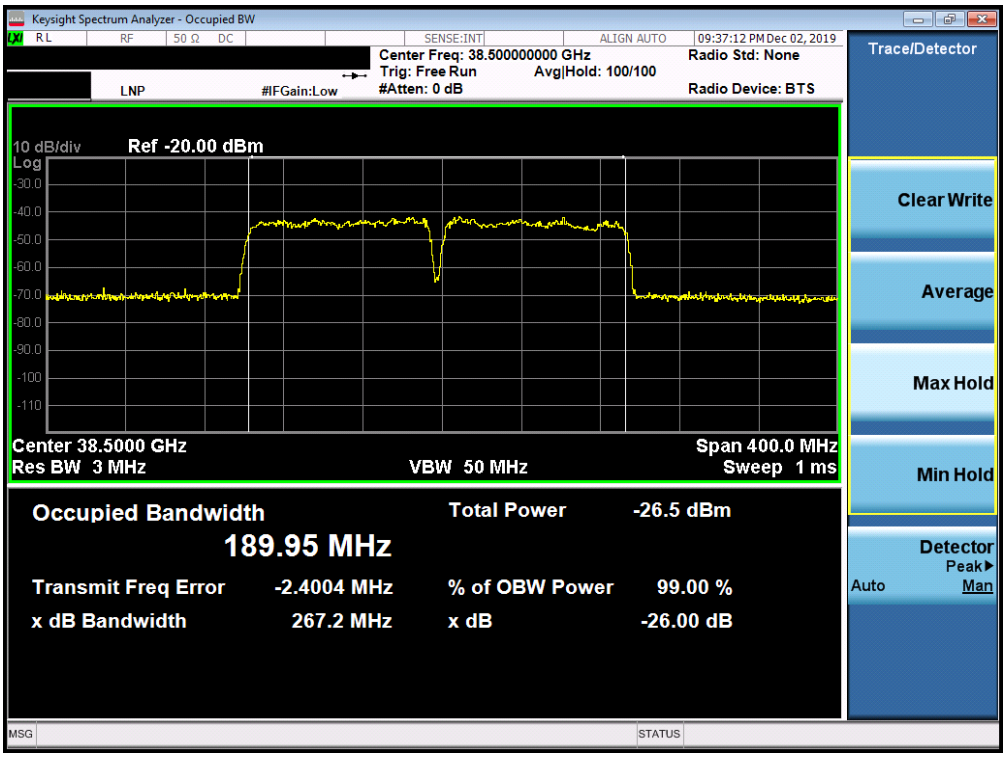
Plot 7-57. Ant1 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



Plot 7-58. Ant1 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)



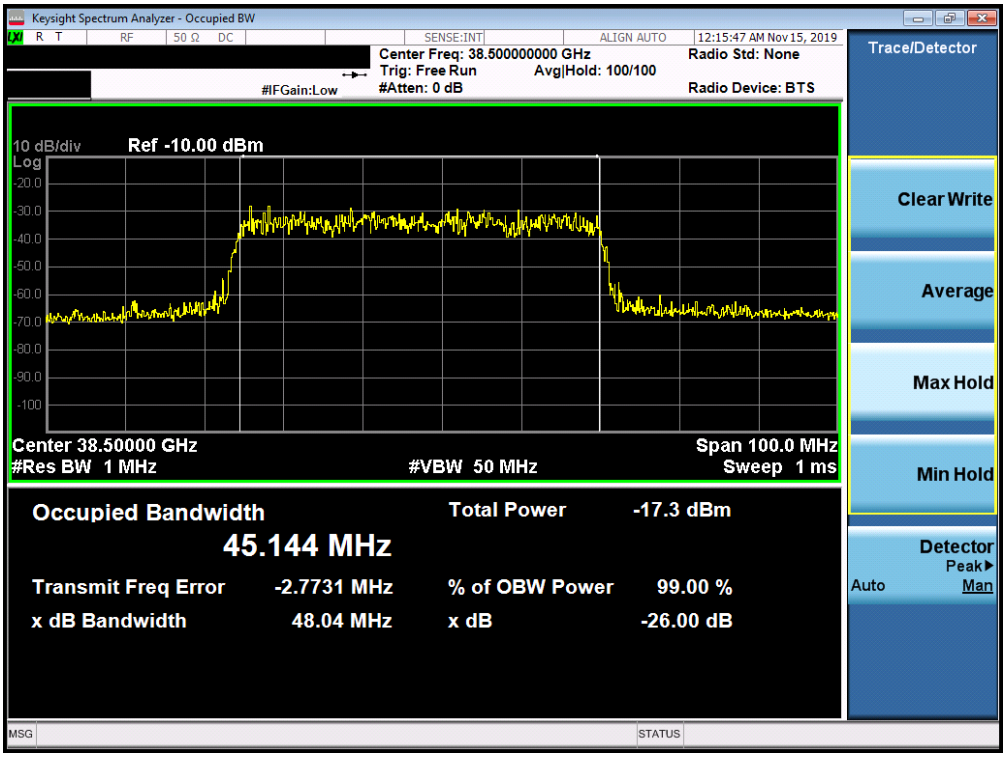
Plot 7-59. Ant1 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)



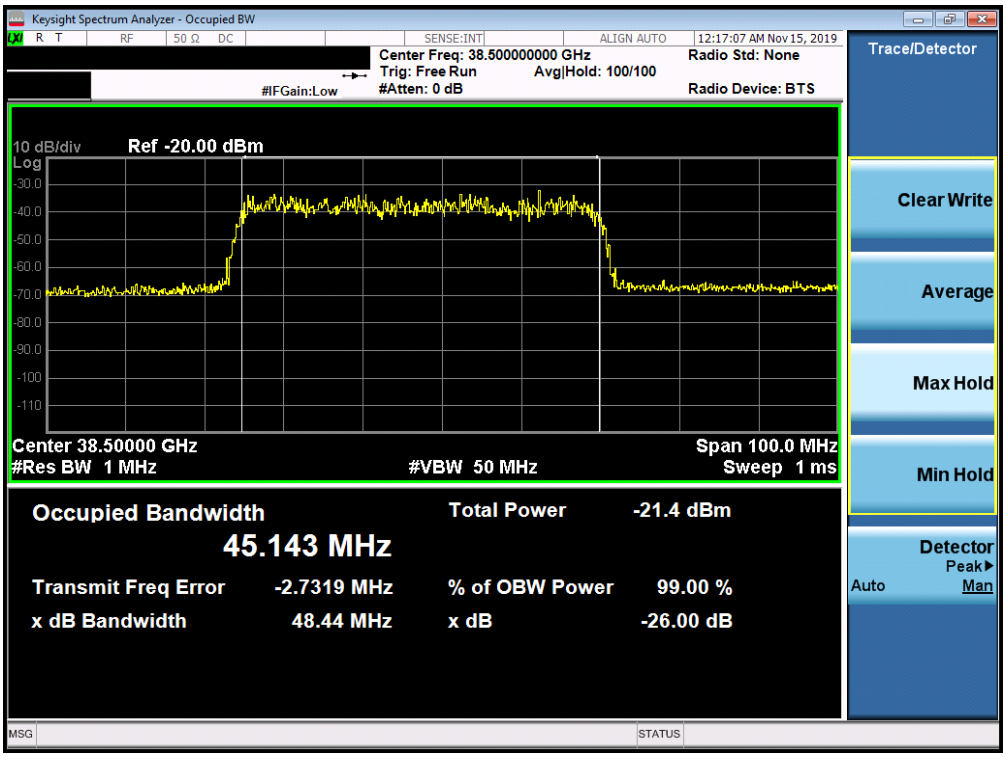
Plot 7-60. Ant1 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

Channel	Bandwidth	CCs Active	Modulation	OBW [MHz]
Mid	50	1	QPSK	45.14
			16QAM	45.14
			64QAM	45.20
		2	QPSK	94.59
			16QAM	95.30
			64QAM	95.72
	100	1	QPSK	90.54
			16QAM	90.53
			64QAM	91.19
		2	QPSK	190.49
			16QAM	191.26
			64QAM	194.53

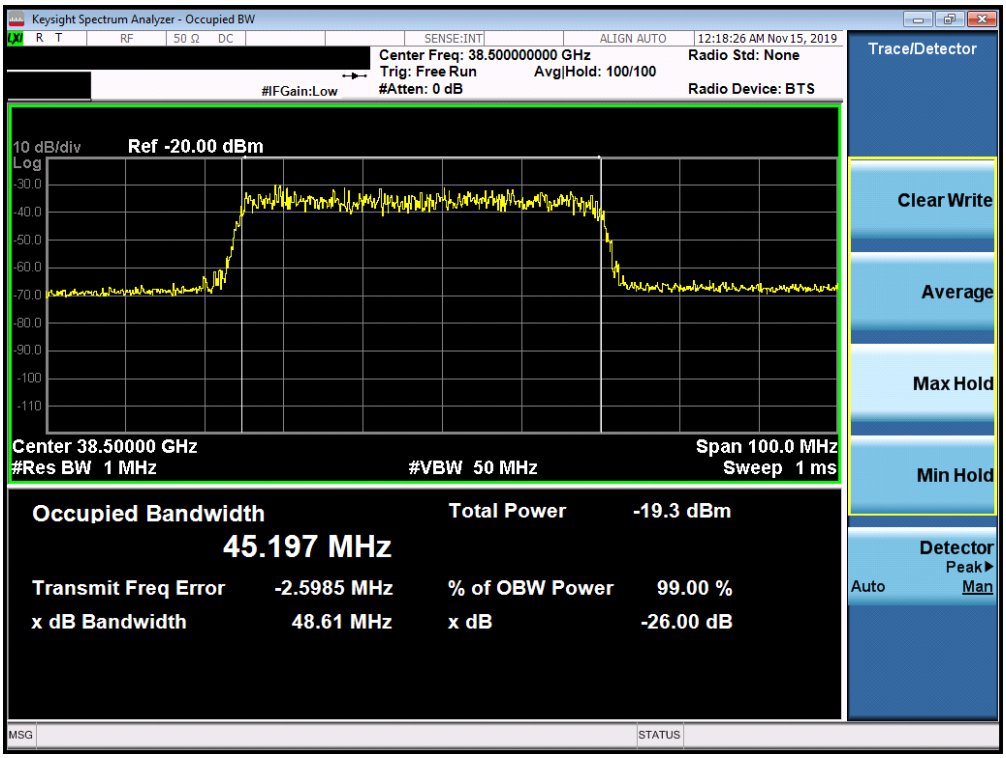
Table 7-7. Summary of Ant2 Occupied Bandwidths (n260)



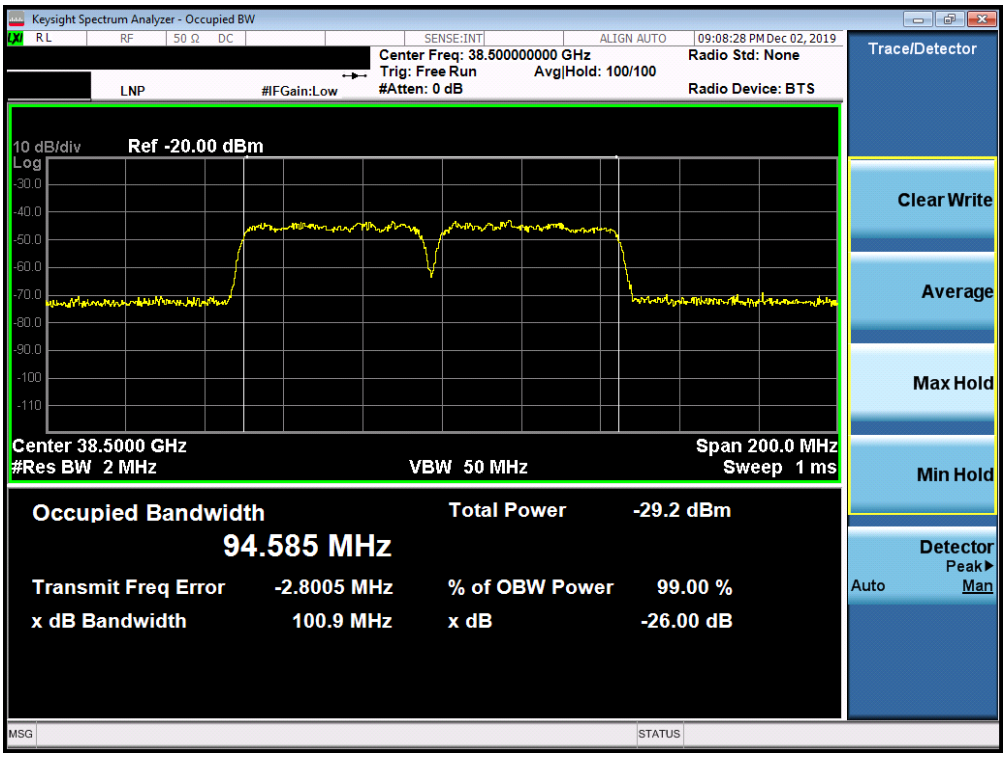
Plot 7-61. Ant2 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)



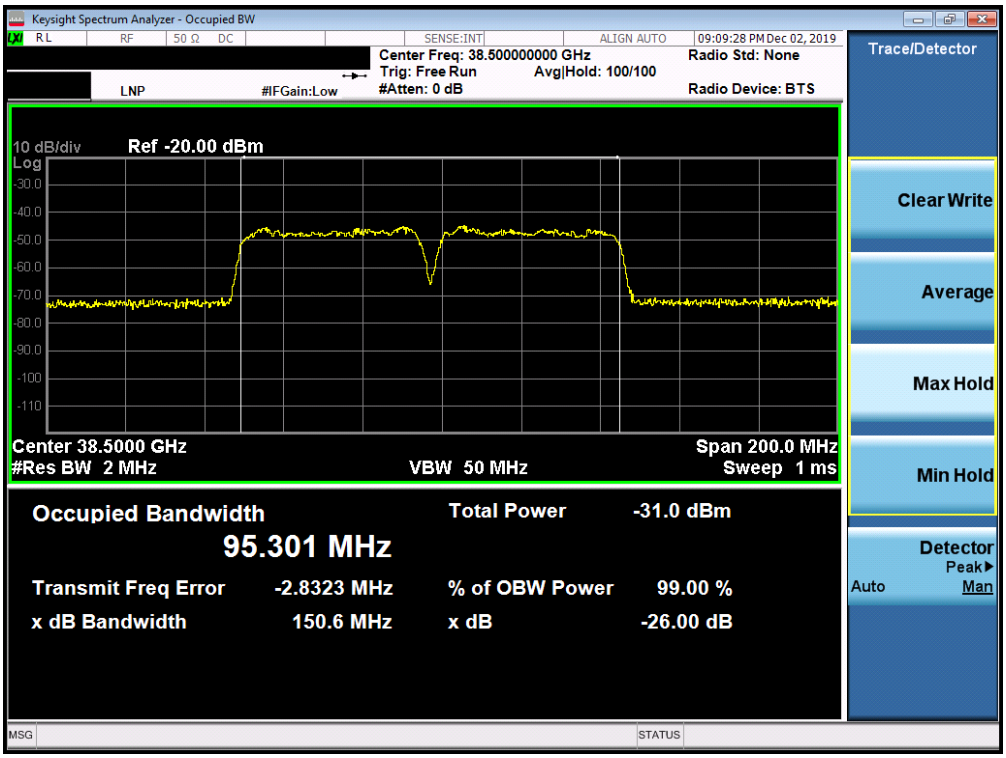
Plot 7-62. Ant2 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



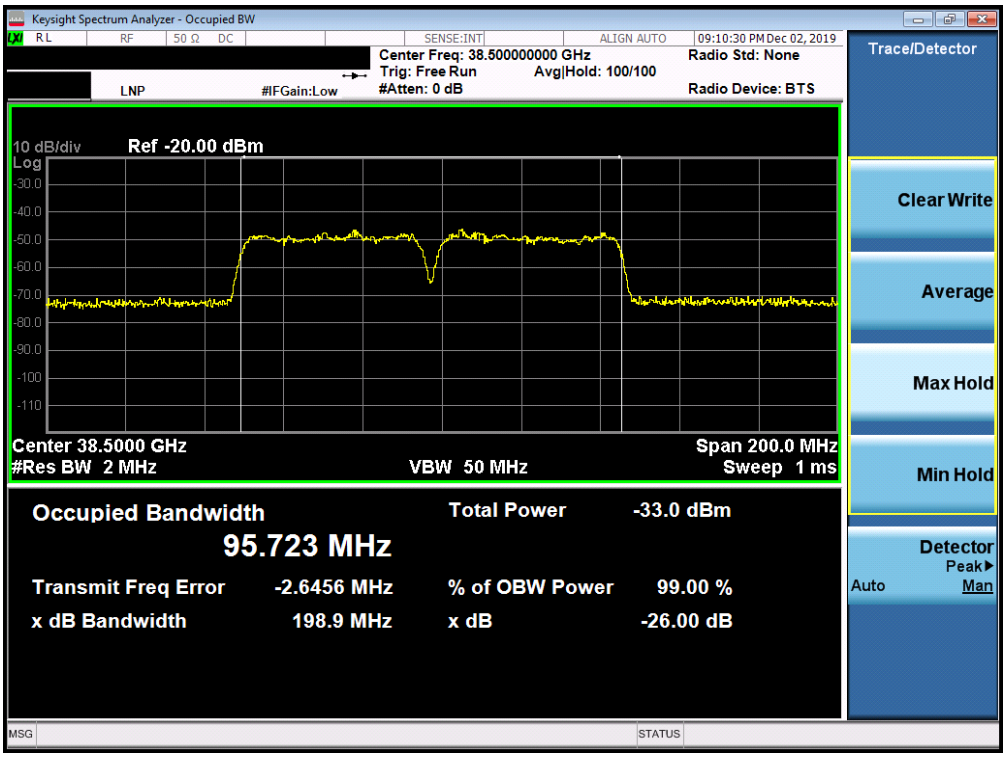
Plot 7-63. Ant2 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



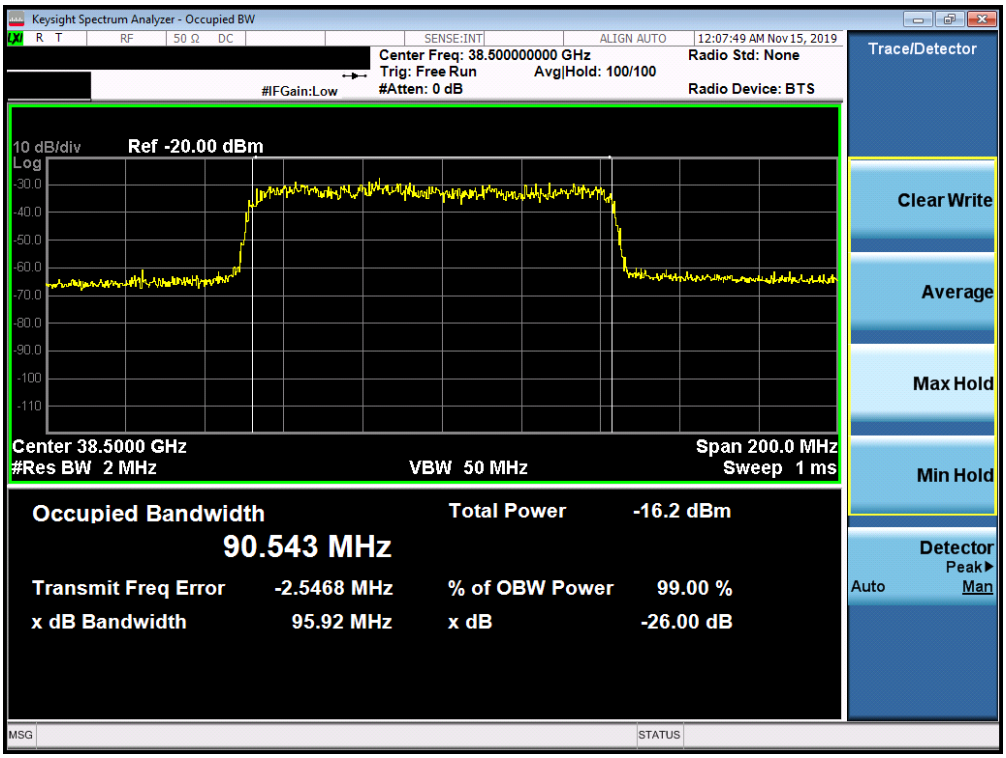
Plot 7-64. Ant2 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



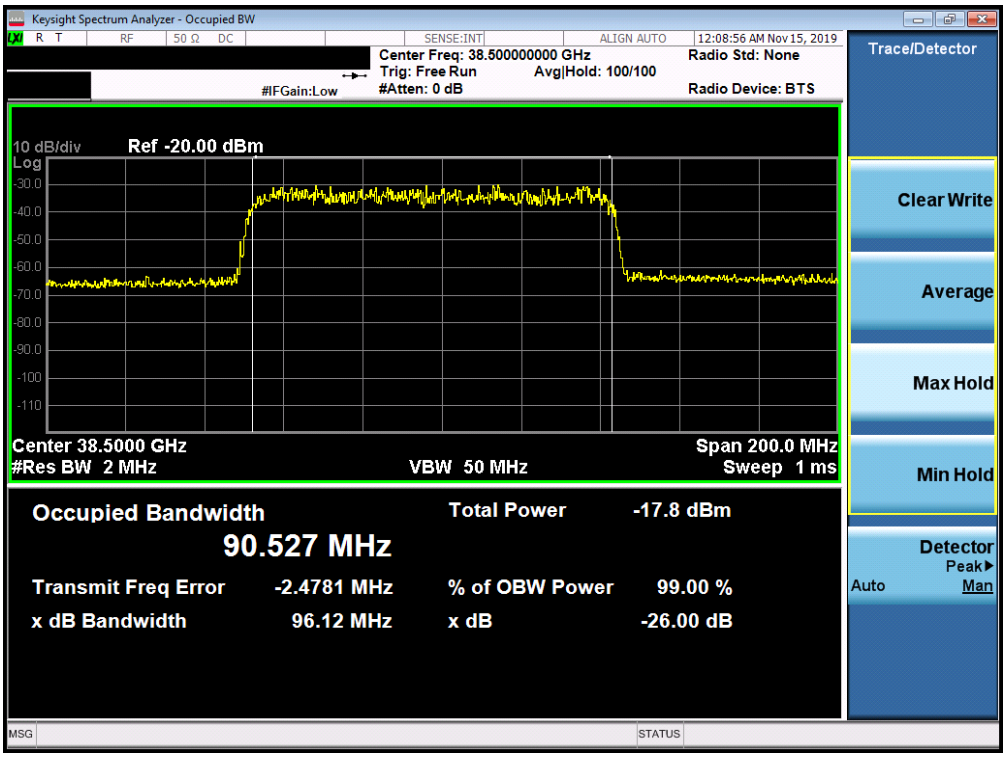
Plot 7-65. Ant2 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



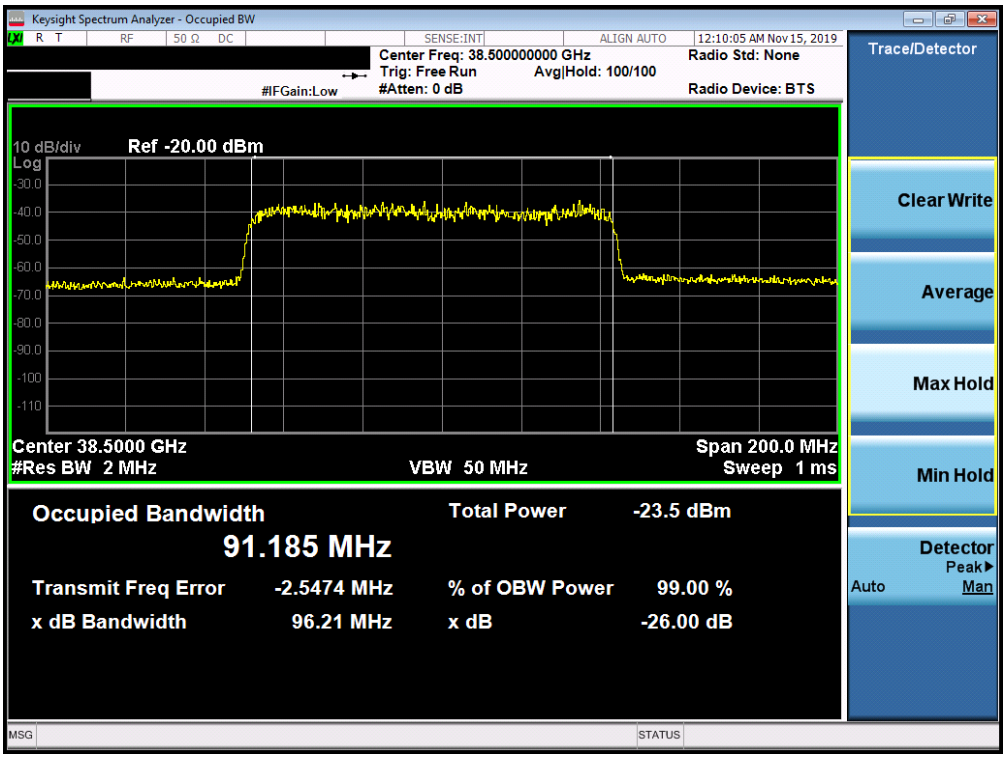
Plot 7-66. Ant2 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)



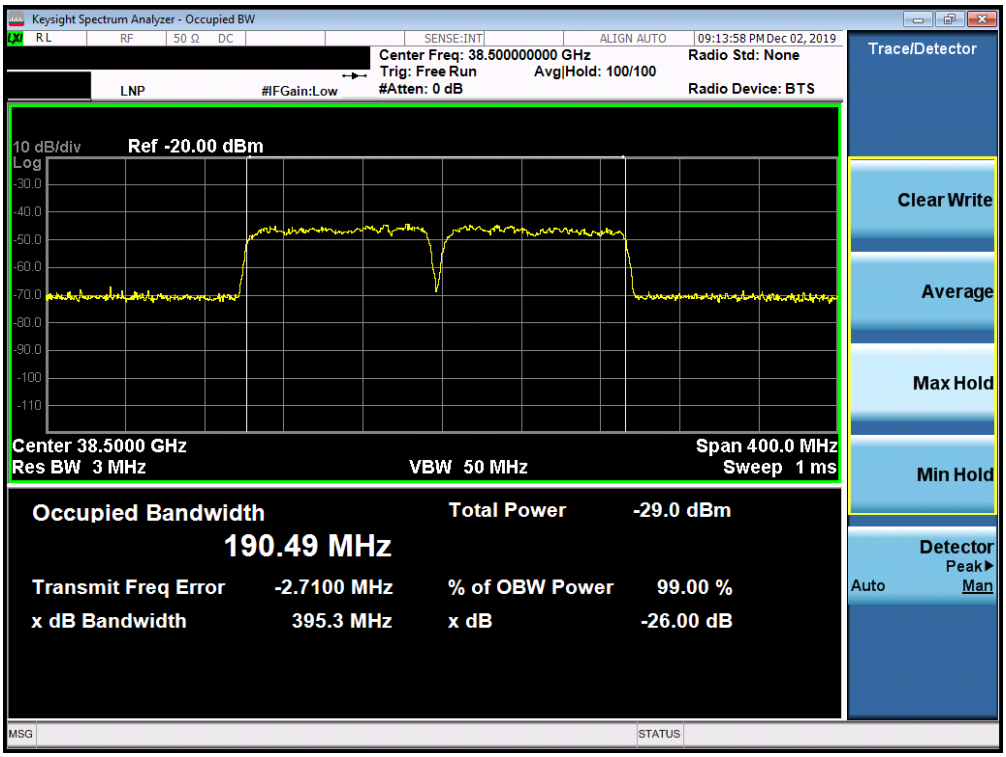
Plot 7-67. Ant2 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)



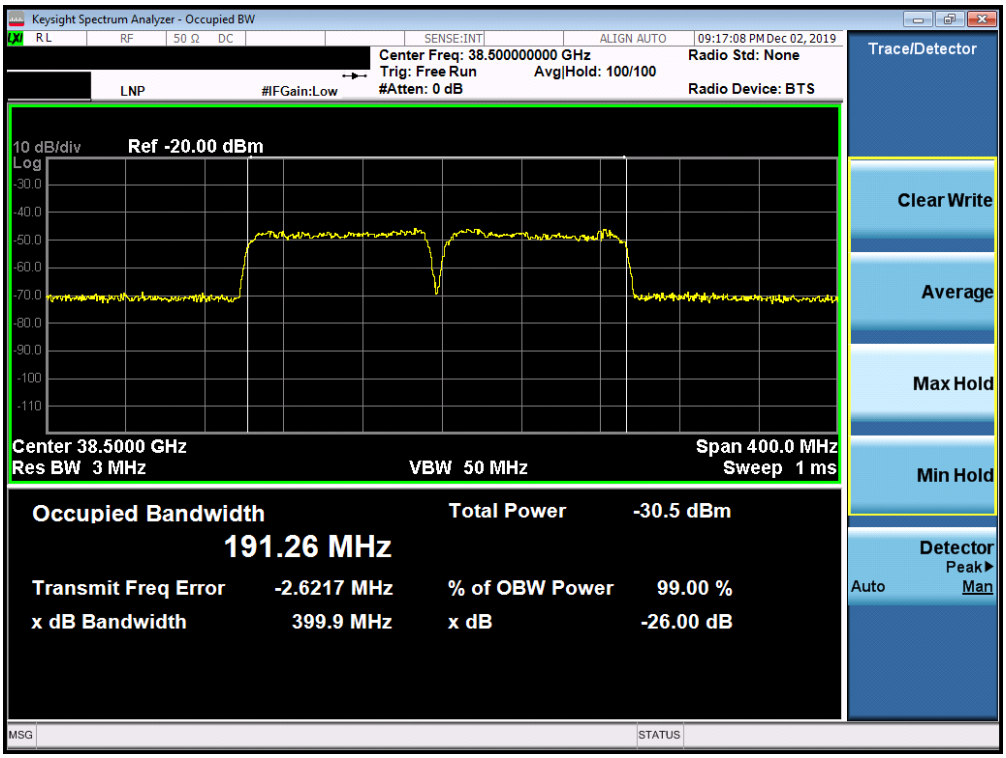
Plot 7-68. Ant2 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



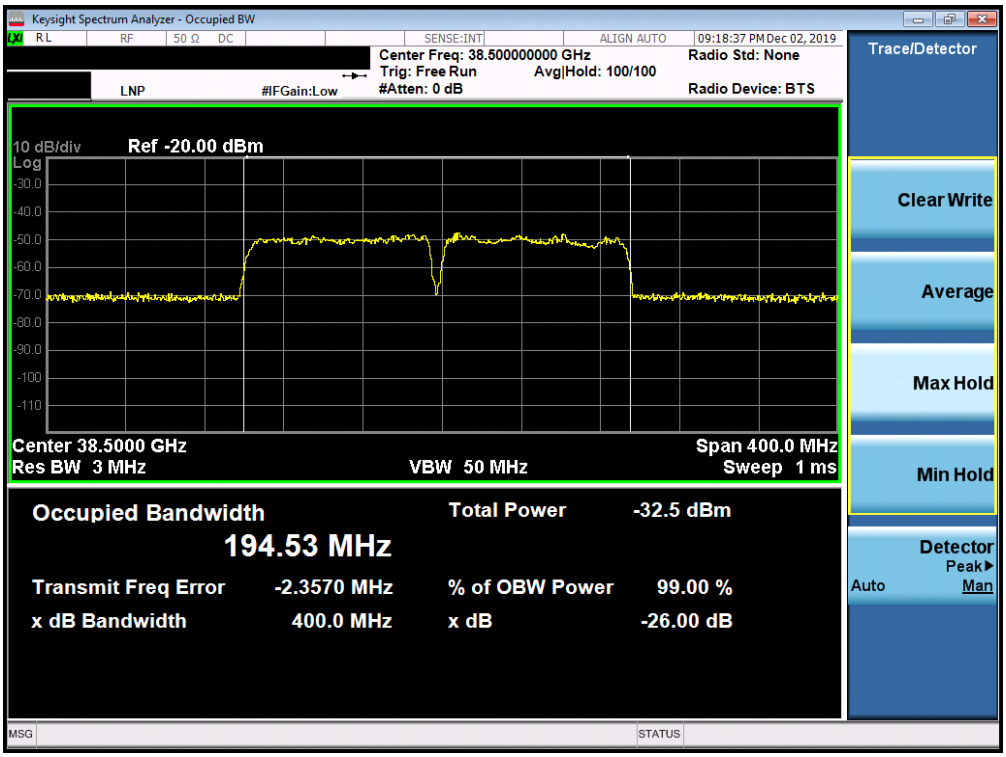
Plot 7-69. Ant2 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



Plot 7-70. Ant2 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)



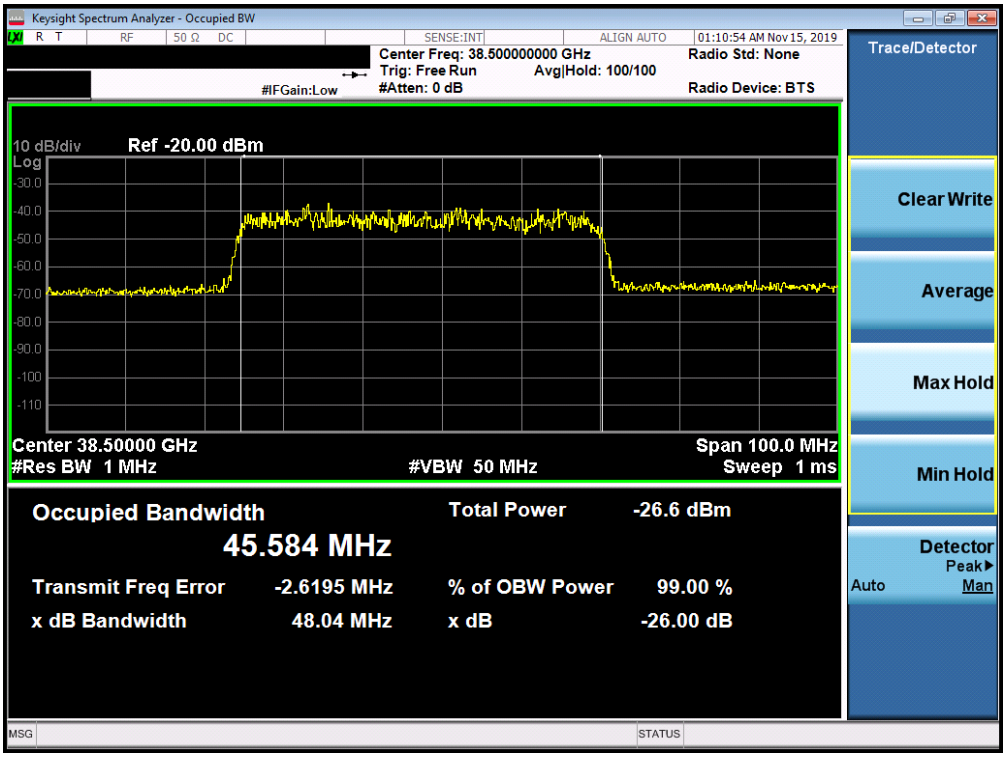
Plot 7-71. Ant2 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)



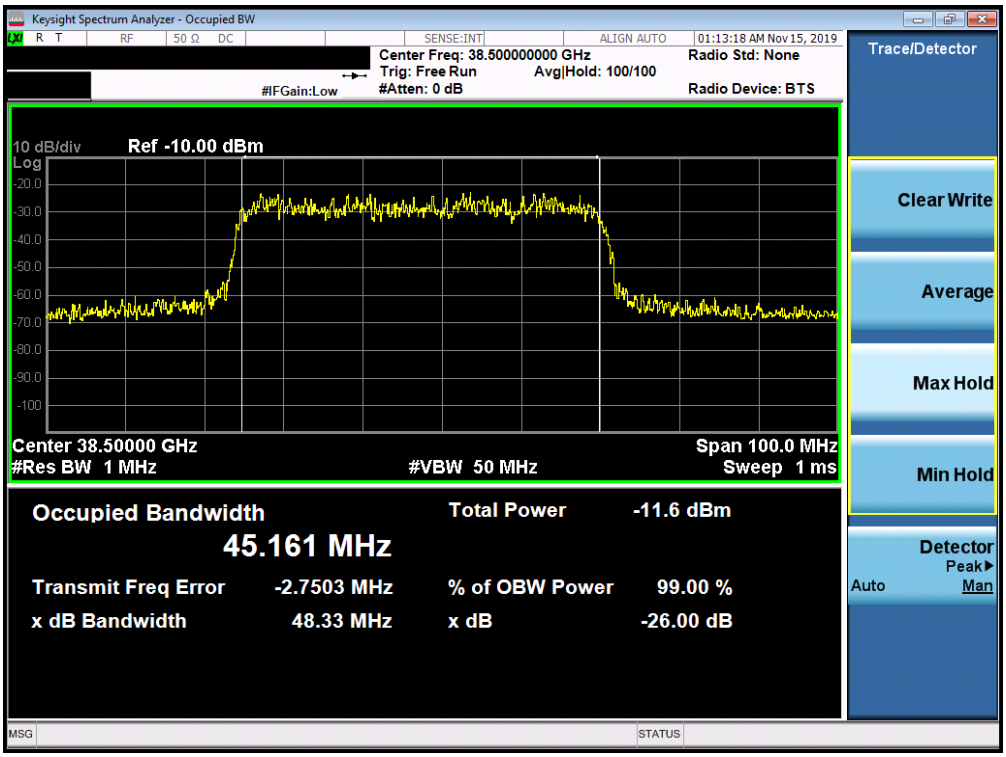
Plot 7-72. Ant2 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

Channel	Bandwidth	CCs Active	Modulation	OBW [MHz]
Mid	50	1	QPSK	45.58
			16QAM	45.16
			64QAM	45.33
		2	QPSK	94.31
			16QAM	94.92
			64QAM	94.89
	100	1	QPSK	92.28
			16QAM	90.98
			64QAM	91.93
		2	QPSK	189.32
			16QAM	189.93
			64QAM	190.13

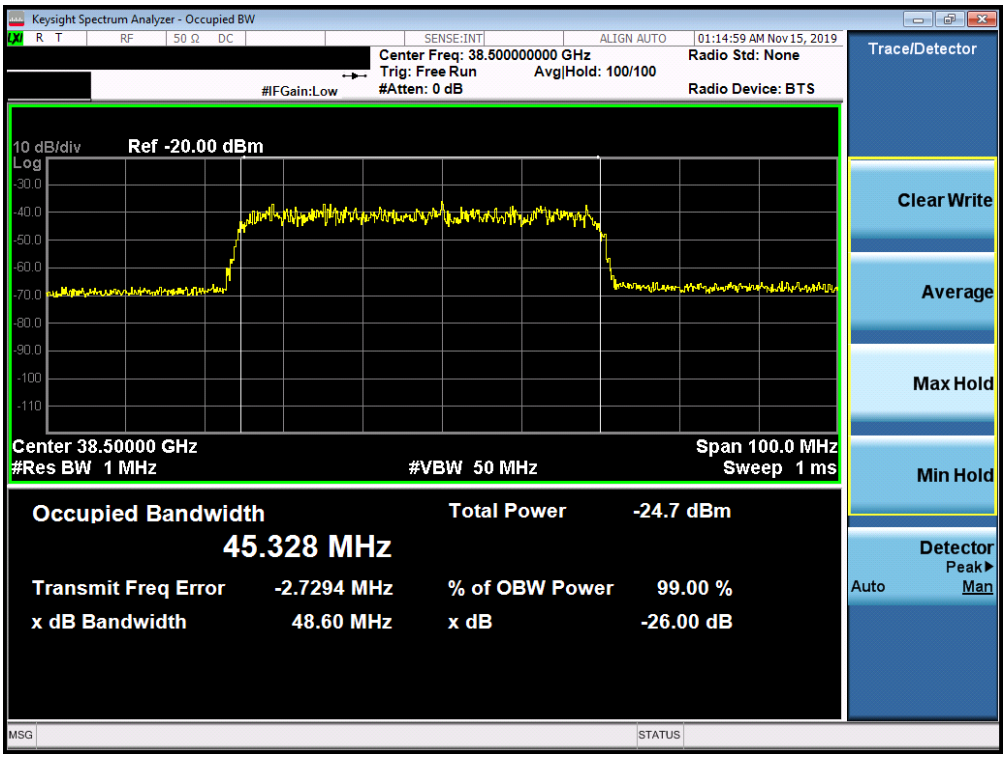
Table 7-8. Summary of Ant3 Occupied Bandwidths (n260)



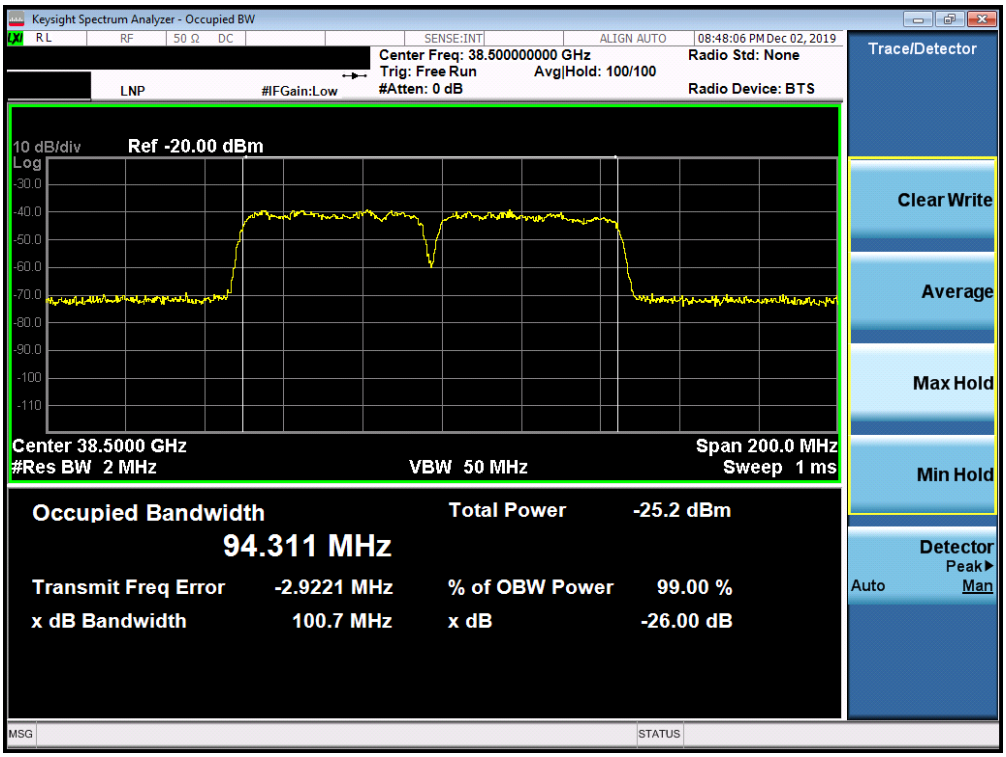
Plot 7-73. Ant3 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)



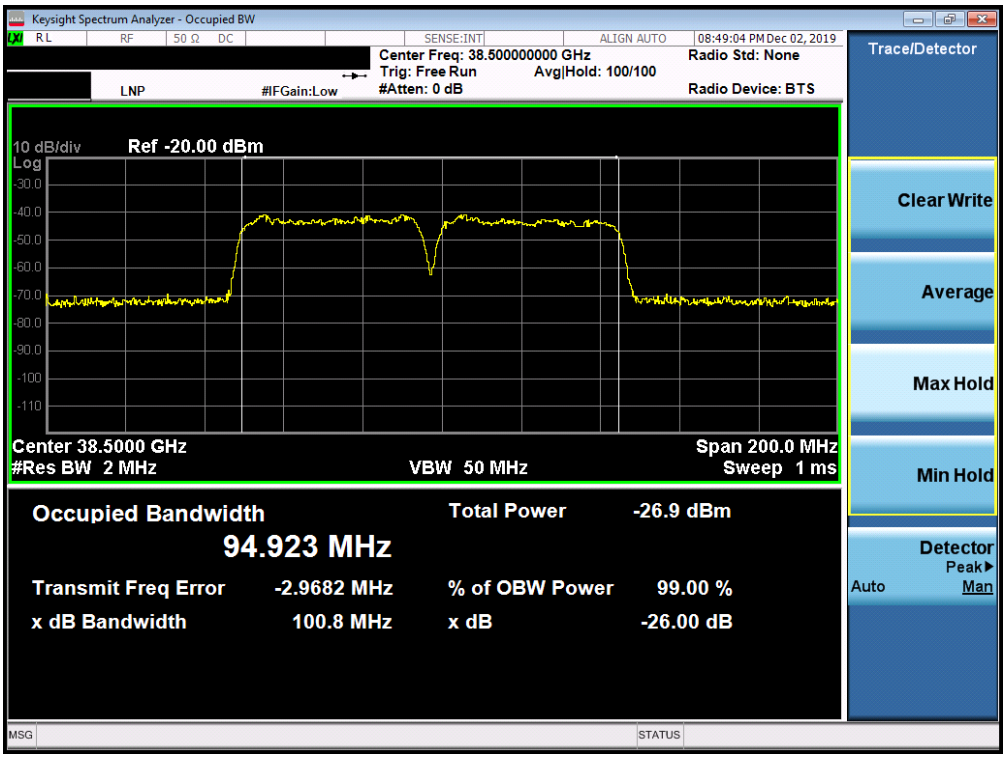
Plot 7-74. Ant3 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



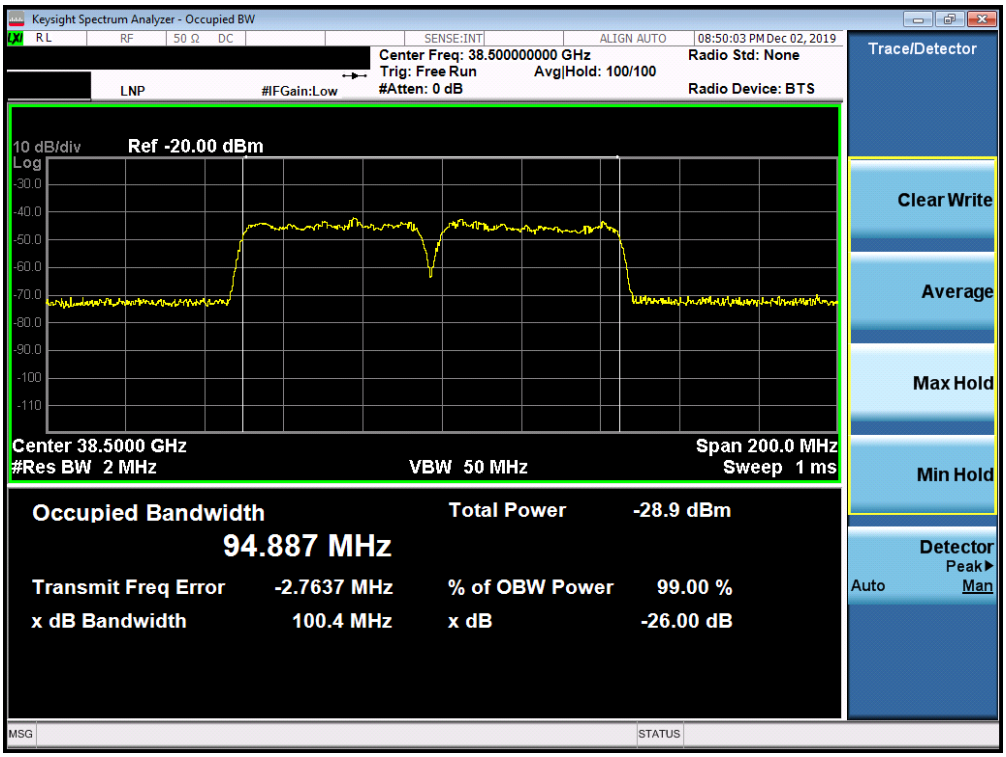
Plot 7-75. Ant3 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



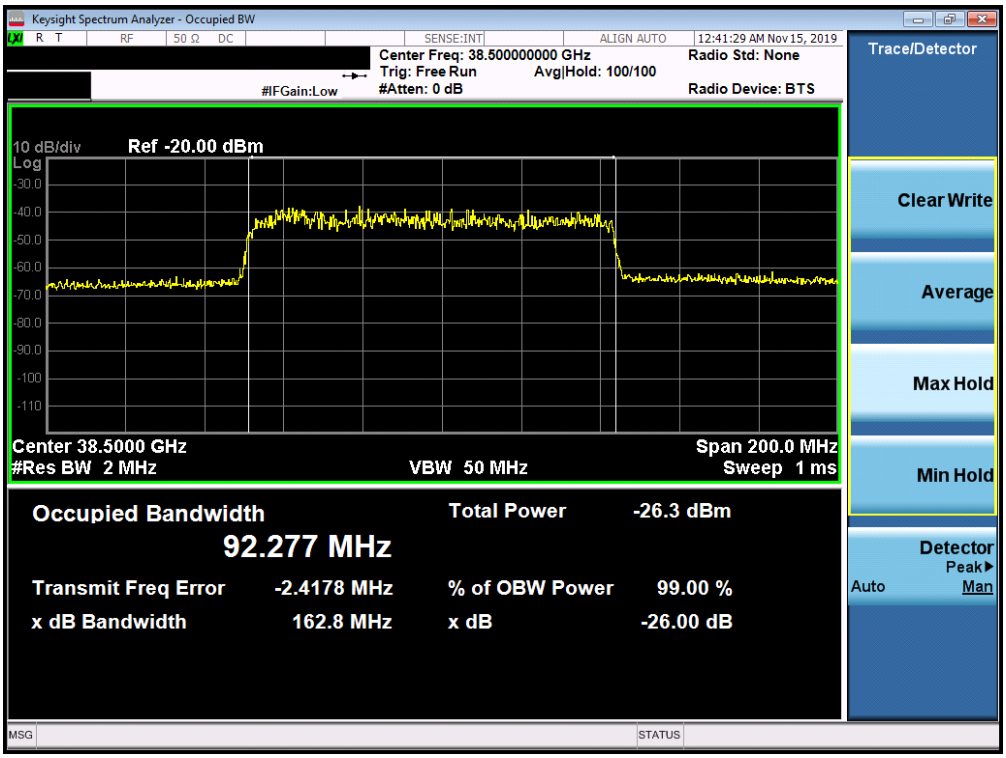
Plot 7-76. Ant3 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



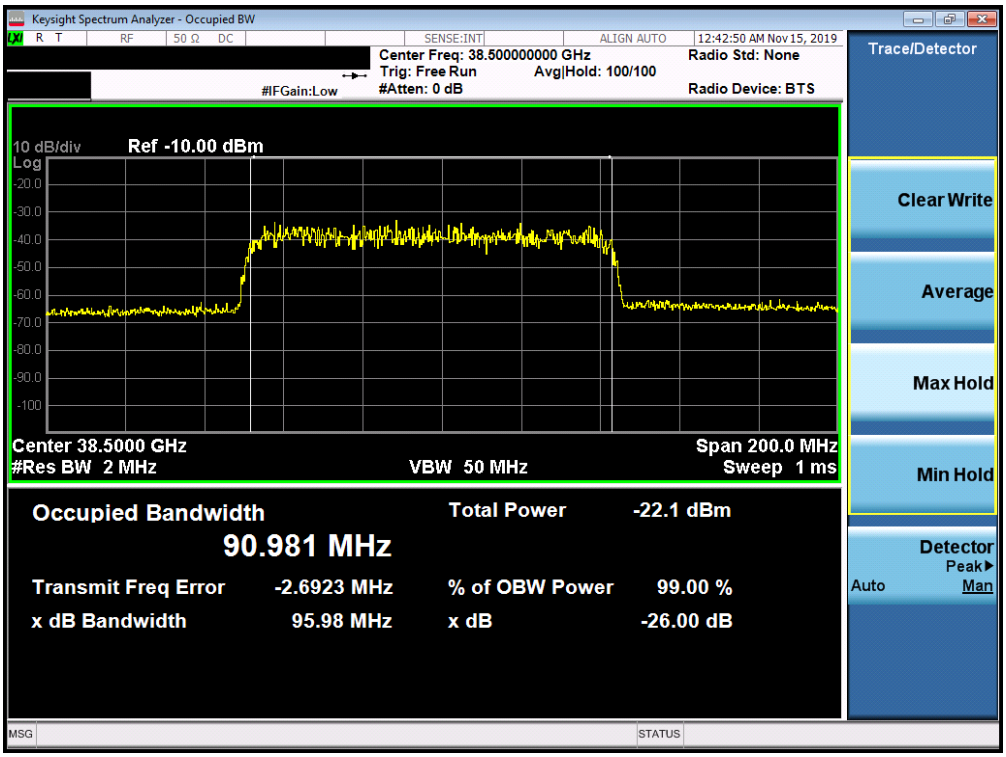
Plot 7-77. Ant3 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



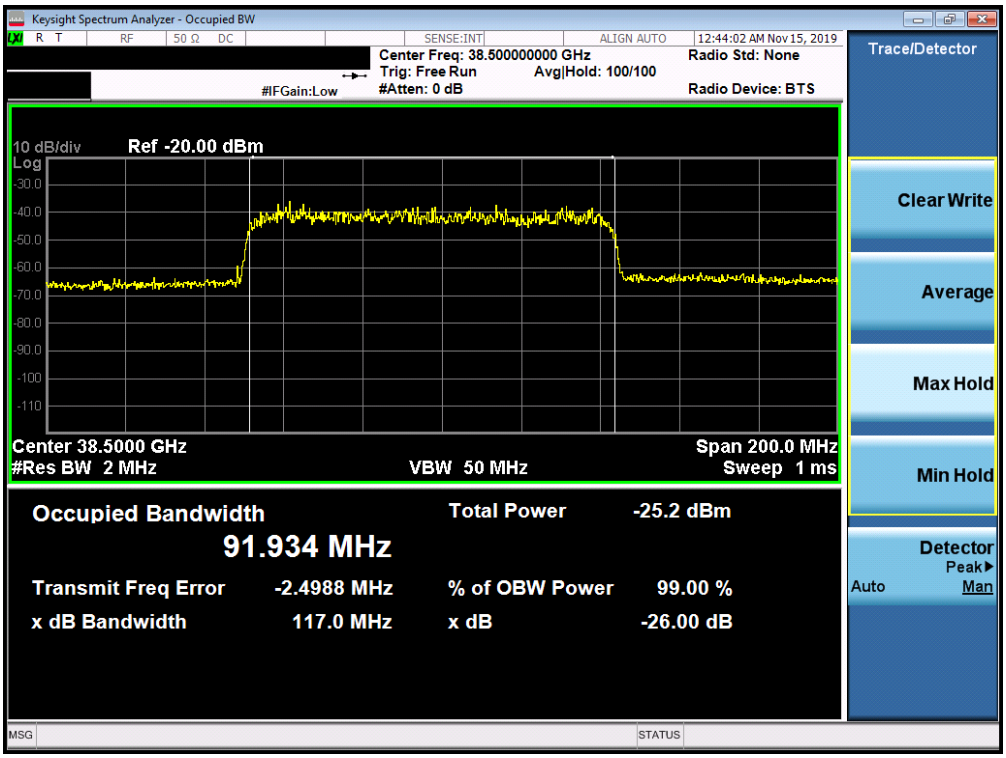
Plot 7-78. Ant3 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)



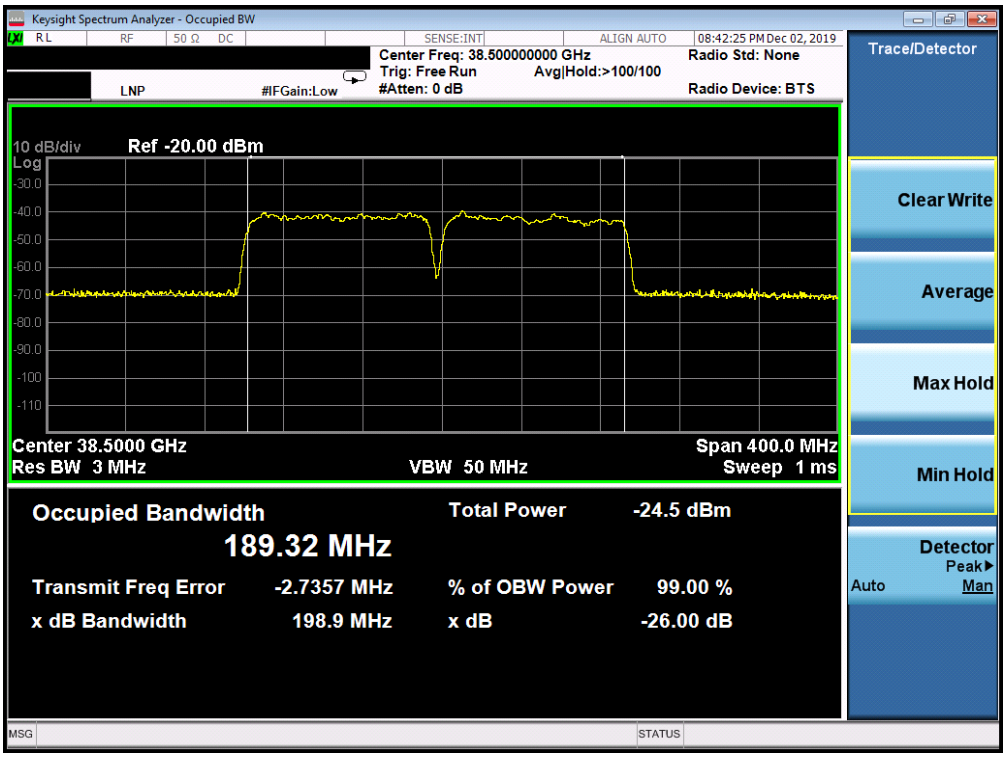
Plot 7-79. Ant3 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)



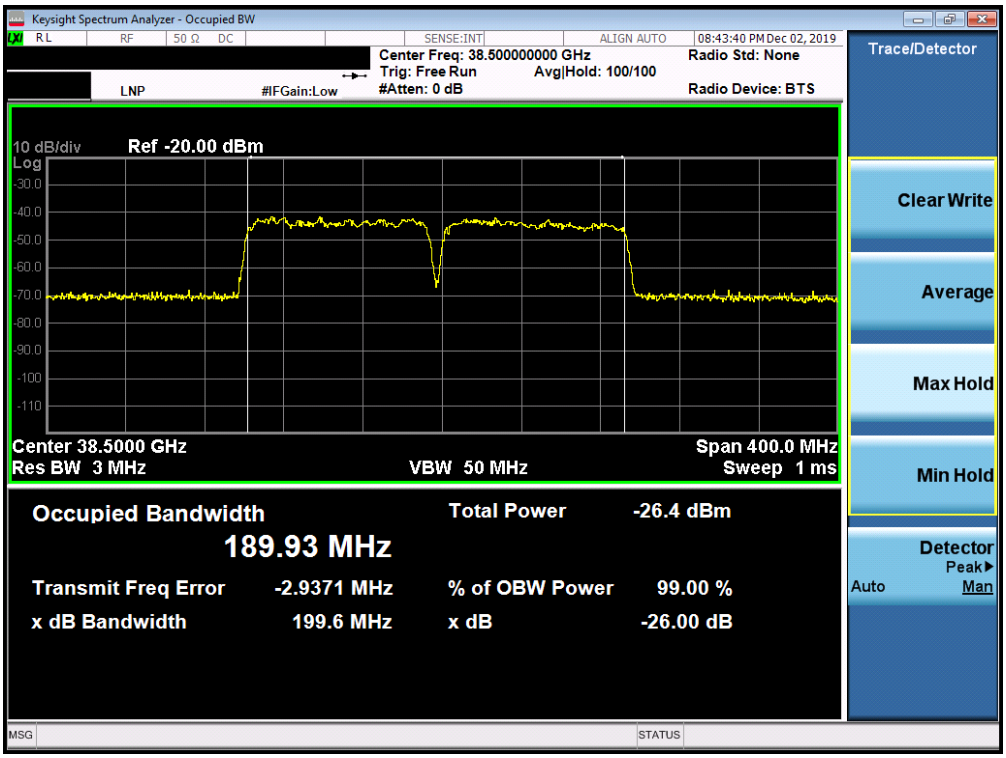
Plot 7-80. Ant3 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



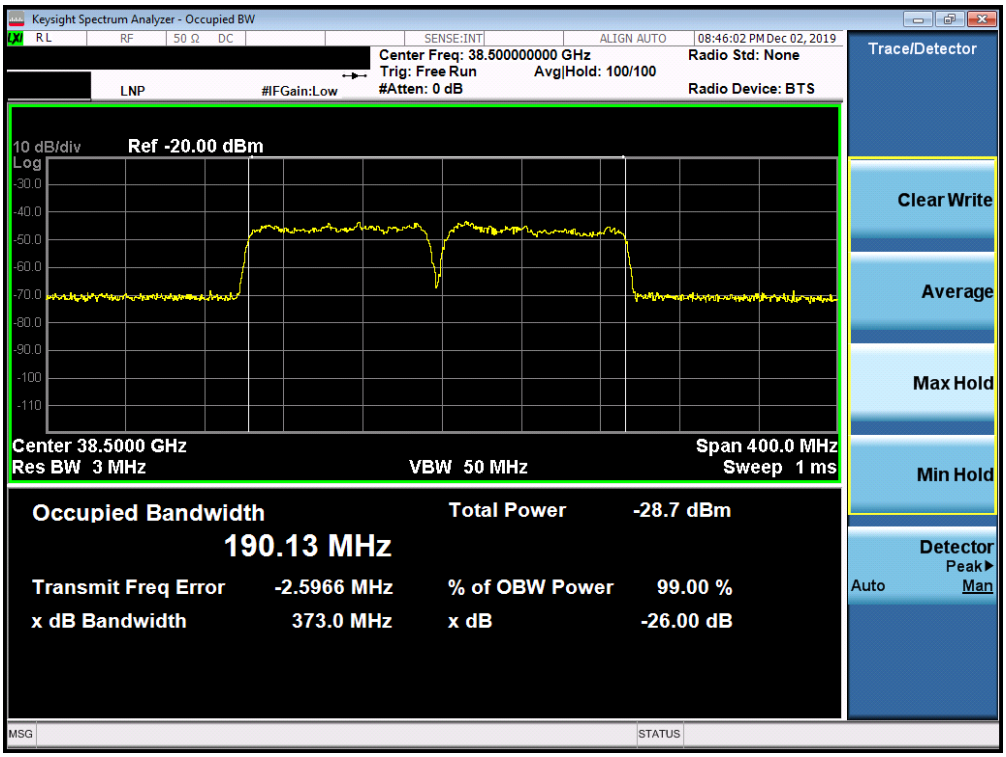
Plot 7-81. Ant3 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



Plot 7-82. Ant3 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)



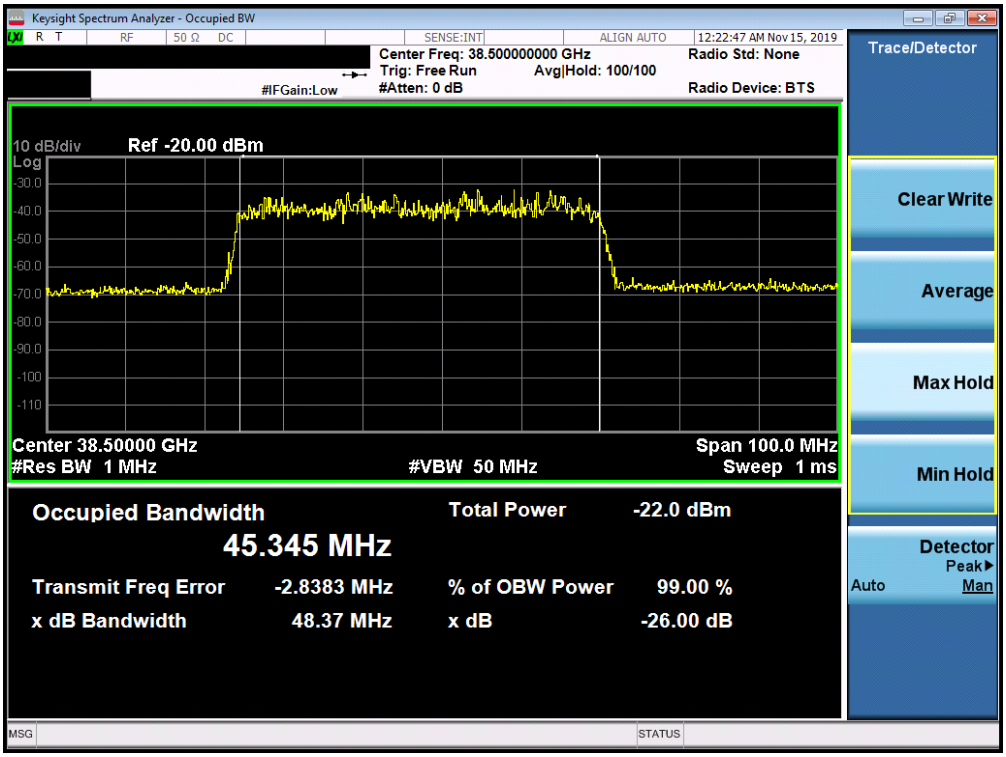
Plot 7-83. Ant3 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)



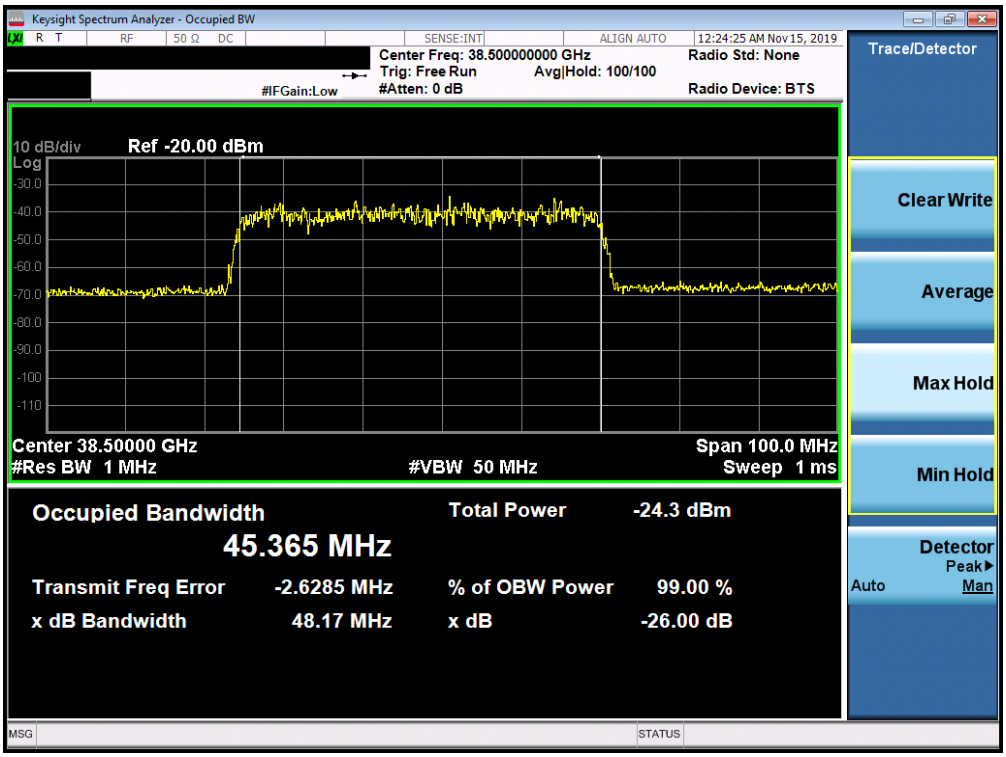
Plot 7-84. Ant3 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

Channel	Bandwidth	CCs Active	Modulation	OBW [MHz]
Mid	50	1	QPSK	45.35
			16QAM	45.37
			64QAM	45.27
		2	QPSK	94.56
			16QAM	94.58
			64QAM	95.09
	100	1	QPSK	90.52
			16QAM	90.70
			64QAM	90.89
		2	QPSK	189.31
			16QAM	189.57
			64QAM	190.02

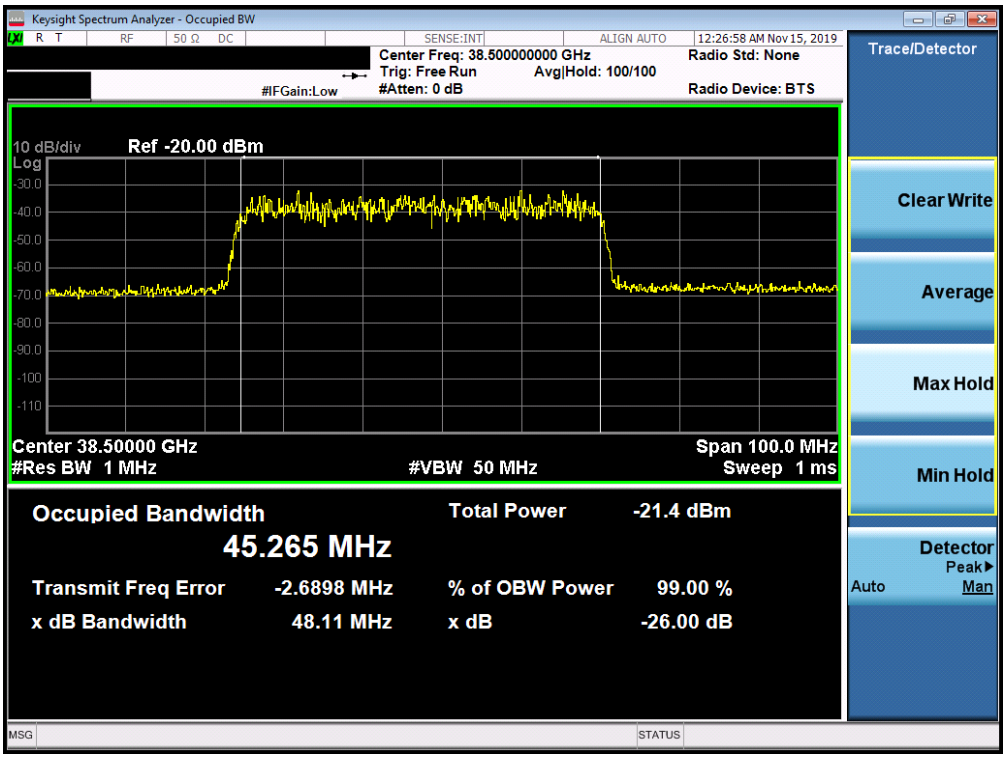
Table 7-9. Summary of Ant4 Occupied Bandwidths (n260)



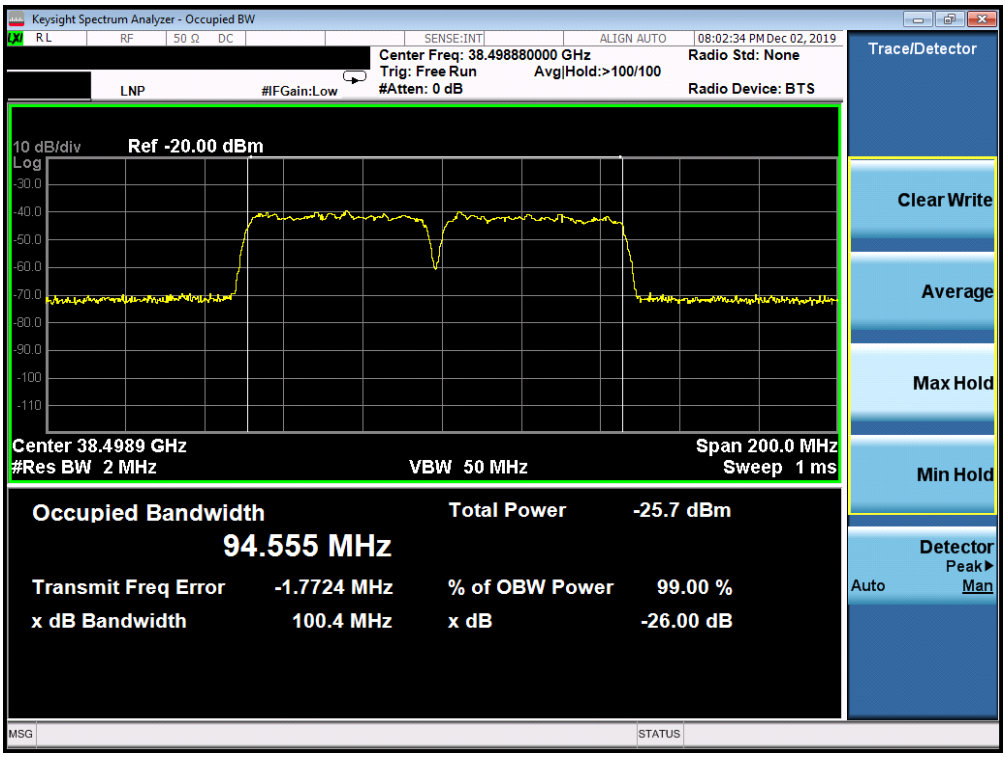
Plot 7-85. Ant4 Occupied Bandwidth Plot (50MHz-1CC – QPSK – Mid Channel)



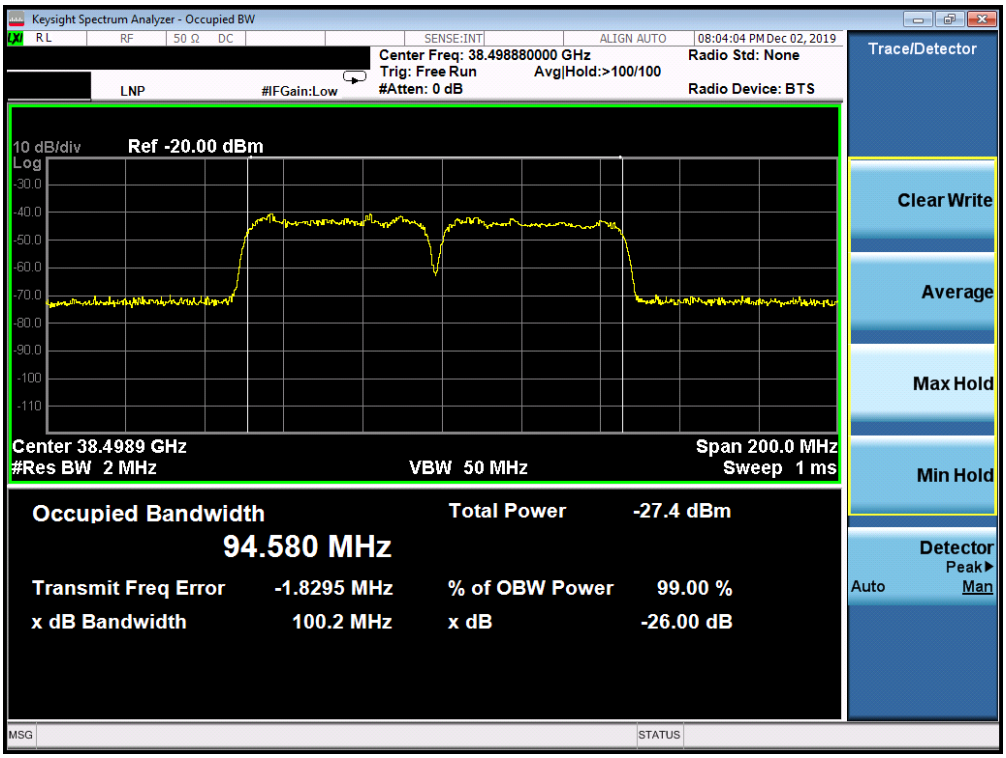
Plot 7-86. Ant4 Occupied Bandwidth Plot (50MHz-1CC – 16QAM – Mid Channel)



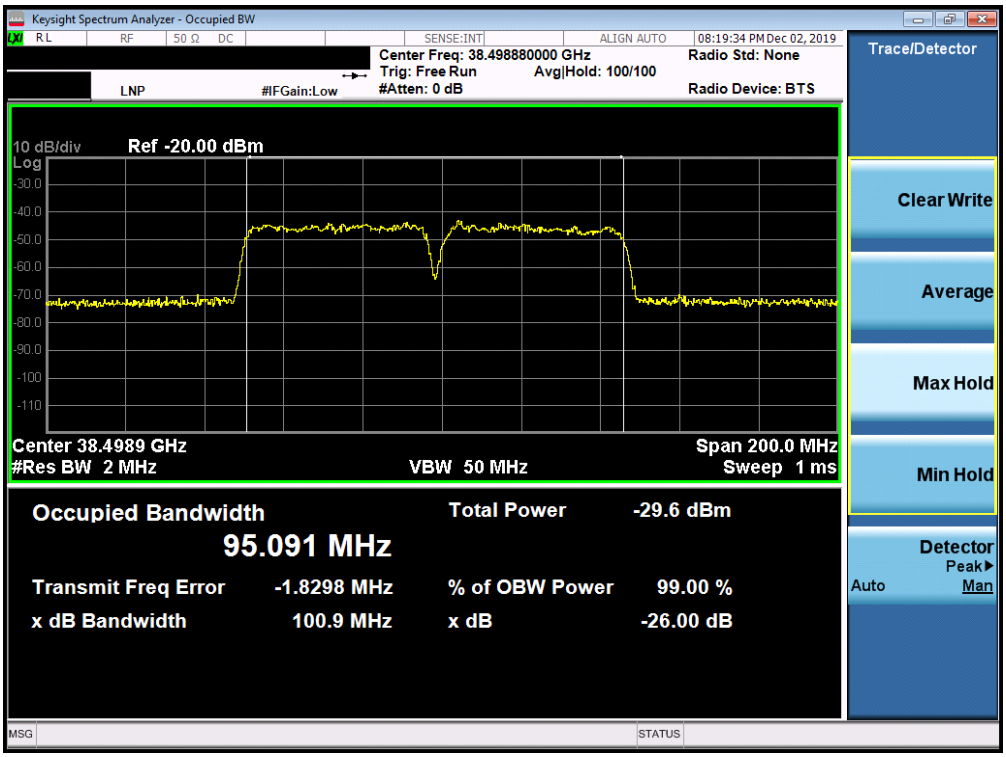
Plot 7-87. Ant4 Occupied Bandwidth Plot (50MHz-1CC – 64QAM – Mid Channel)



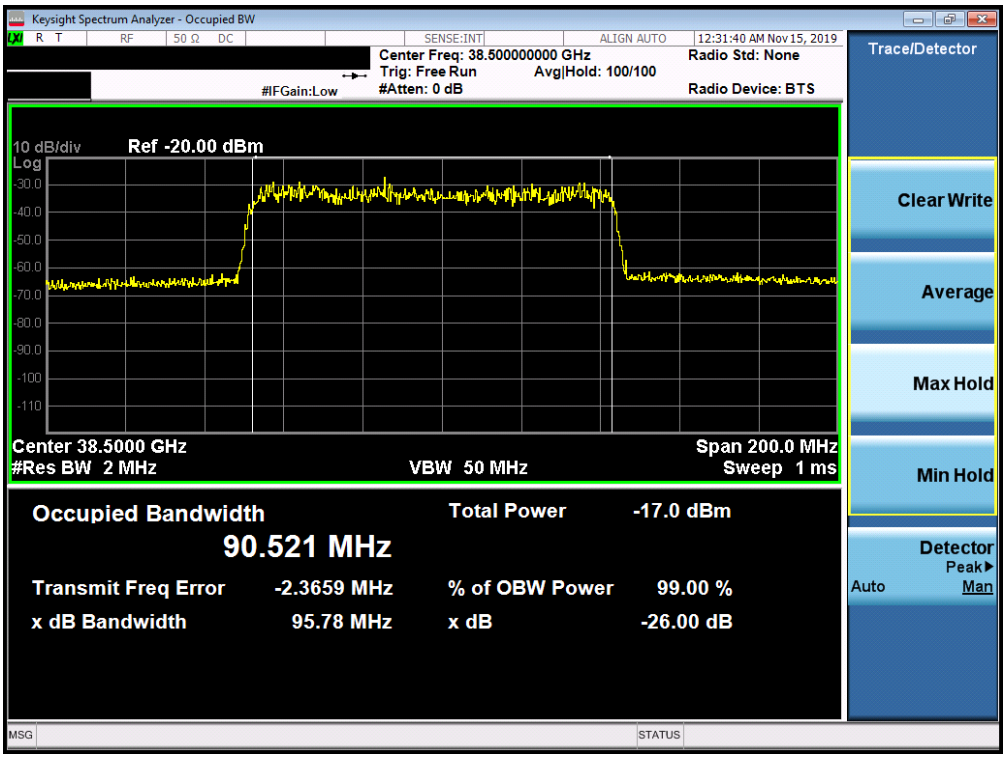
Plot 7-88. Ant4 Occupied Bandwidth Plot (50MHz-2CC – QPSK – Mid Channel)



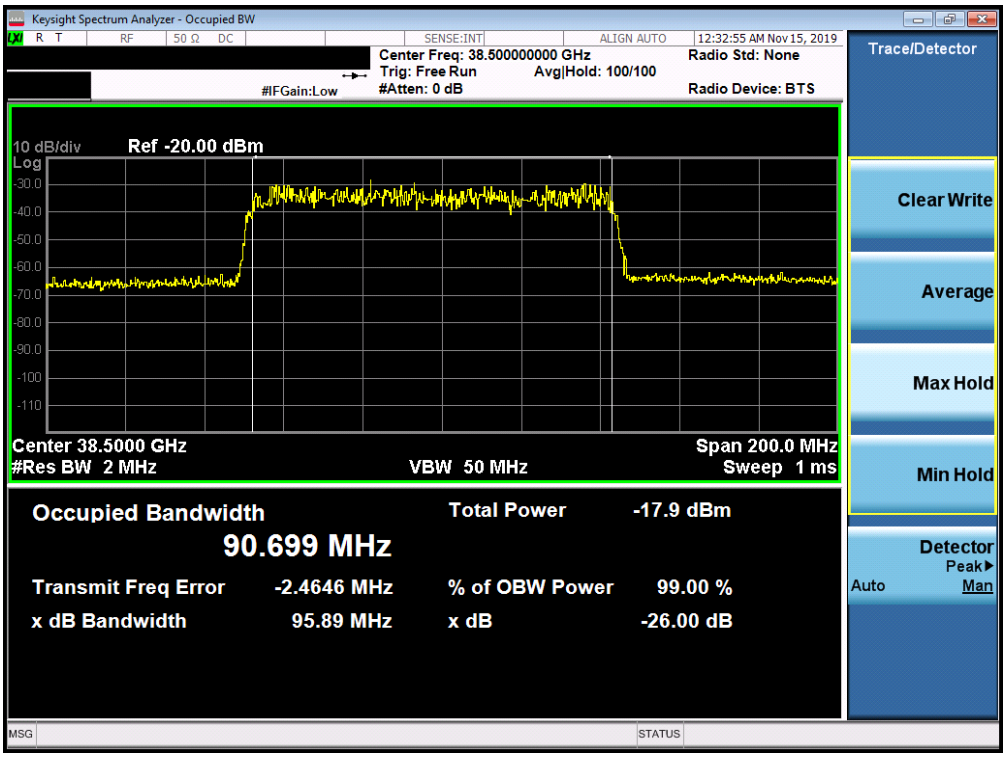
Plot 7-89. Ant4 Occupied Bandwidth Plot (50MHz-2CC – 16QAM – Mid Channel)



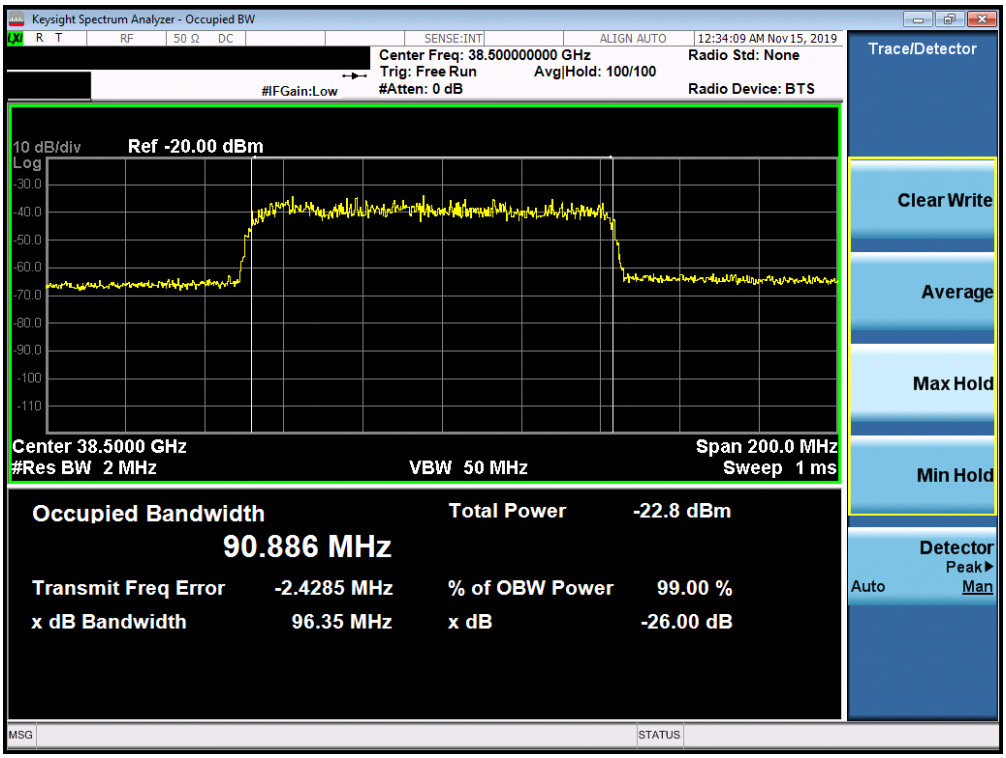
Plot 7-90. Ant4 Occupied Bandwidth Plot (50MHz-2CC – 64QAM – Mid Channel)



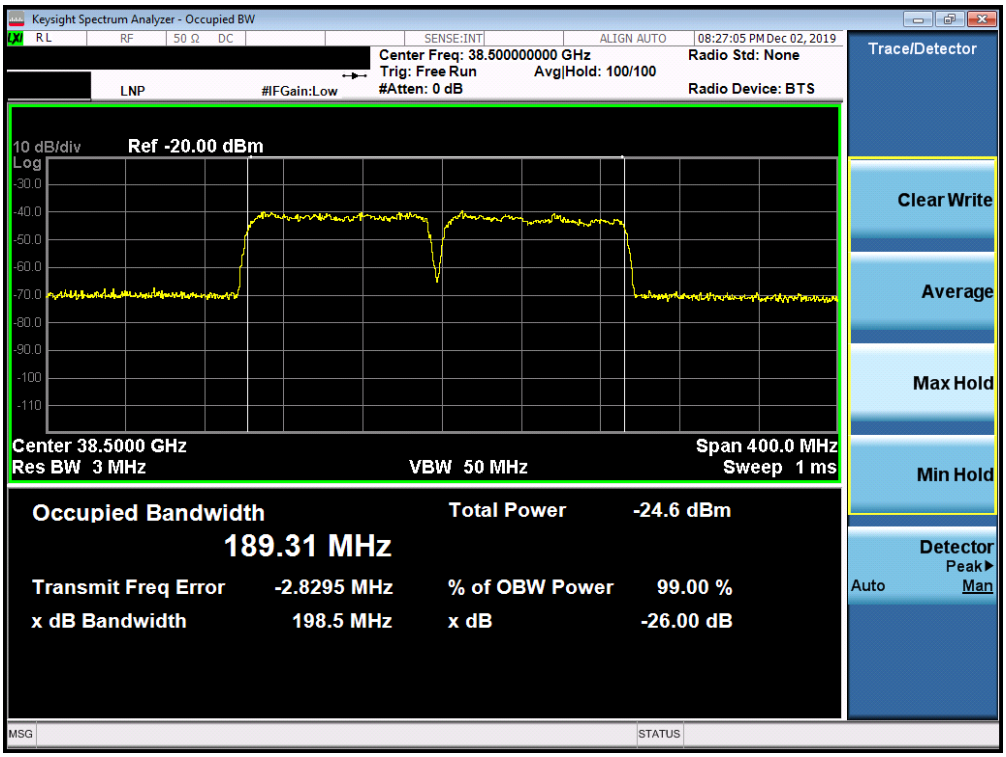
Plot 7-91. Ant4 Occupied Bandwidth Plot (100MHz-1CC – QPSK – Mid Channel)



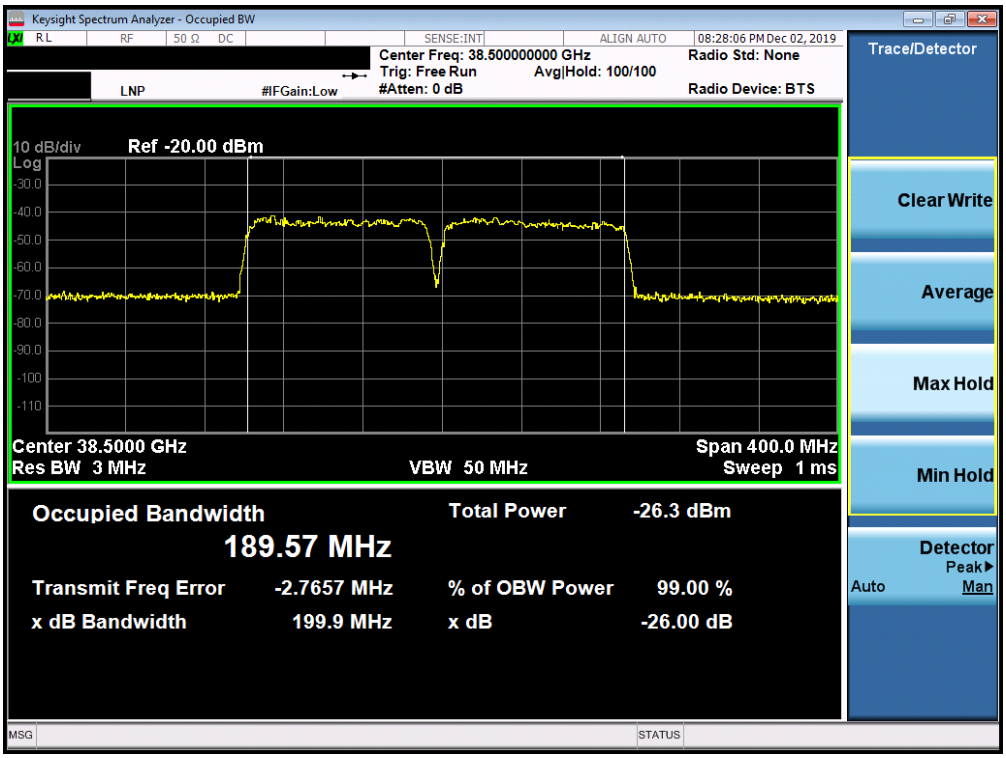
Plot 7-92. Ant4 Occupied Bandwidth Plot (100MHz-1CC – 16QAM – Mid Channel)



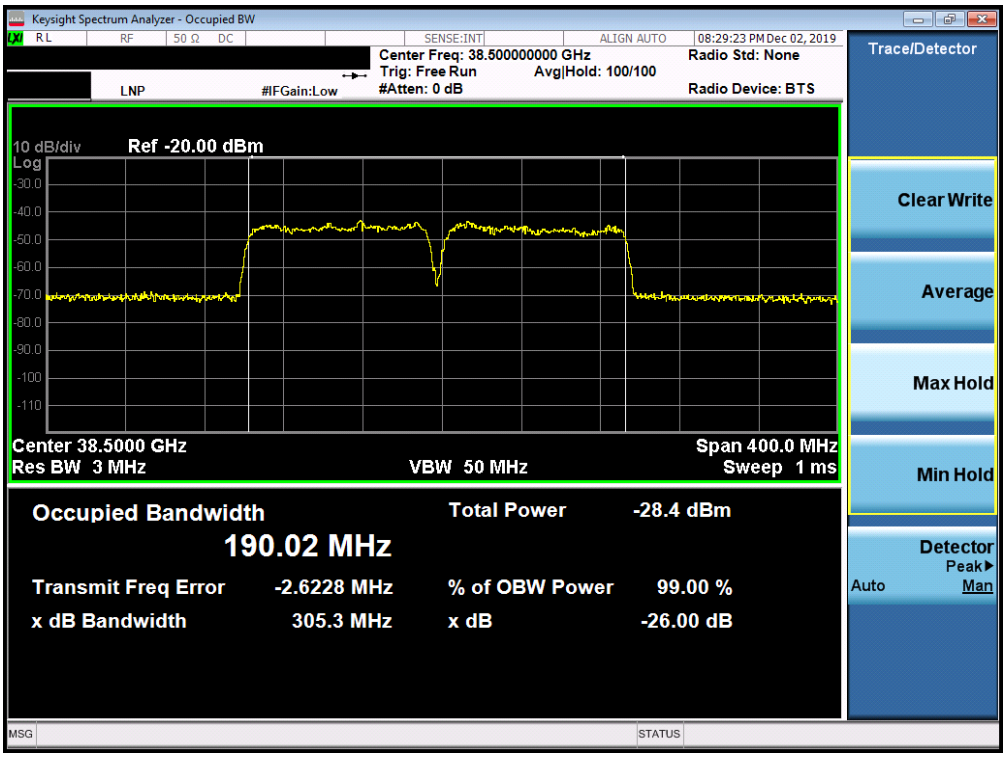
Plot 7-93. Ant4 Occupied Bandwidth Plot (100MHz-1CC – 64QAM – Mid Channel)



Plot 7-94. Ant4 Occupied Bandwidth Plot (100MHz-2CC – QPSK – Mid Channel)



Plot 7-95. Ant4 Occupied Bandwidth Plot (100MHz-2CC – 16QAM – Mid Channel)



Plot 7-96. Ant4 Occupied Bandwidth Plot (100MHz-2CC – 64QAM – Mid Channel)

7.3 Equivalent Isotropic Radiated Power

§2.1046, §30.202

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.

Test Procedures Used

ANSI C63.26-2015 Section 5.2.4.4.1
KDB 842590 D01 v01 Section 4.2

Test Settings

1. Radiated power measurements are performed using the signal analyzer's "channel power" measurement capability for signals with continuous operation.
2. RBW = 1 – 5% of the expected OBW, not to exceed 1MHz
3. VBW ≥ 3 x RBW
4. Span = 2x to 3x the OBW
5. No. of sweep points ≥ 2 x span / RBW
6. Detector = RMS
7. The integration bandwidth was roughly set equal to the measured OBW of the signal for signals with continuous operation.
8. Trace mode = trace averaging (RMS) over 100 sweeps
9. The trace was allowed to stabilize

Test Notes

1) The EUT was tested in three orthogonal planes 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) EIRP measurements were taken at 1m test distance.

4) The average EIRP reported below is calculated per section 5.2.7 of ANSI C63.26-2015 which states: EIRP (dBm) = E (dBµV/m) + 20log(D) − 104.8; where D is the measurement distance (in the far field region) in m. The field strength E is calculated E (dBµV/m) = Spectrum Analyzer Channel Power Level (dBm) + Antenna Factor (dB/m) + Cable Loss (dB) + 107.

5) 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.

Band n261 Beam ID Configurations

Mode	Beam Polarization	Beam ID
SISO	H	168
	V	26
MIMO	H	167
	V	41

Table 7-10. Ant1 Worst Case Beam ID

Mode	Beam Polarization	Beam ID
SISO	H	147
	V	9
MIMO	H	147
	V	18

Table 7-11. Ant2 Worst Case Beam ID

Mode	Beam Polarization	Beam ID
SISO	H	177
	V	36
MIMO	H	176
	V	49

Table 7-12. Ant3 Worst Case Beam ID

Mode	Beam Polarization	Beam ID
SISO	H	172
	V	31
MIMO	H	158
	V	31

Table 7-13. Ant4 Worst Case Beam ID

Band n261

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27534.84	Low	H	QPSK	H	93	72	1/16	23.34
	27534.84	Low	V	QPSK	V	83	125	1/16	23.42
	27922.08	Mid	H	QPSK	H	97	73	1/16	21.81
	27922.08	Mid	V	QPSK	V	85	125	1/16	21.54
	28319.52	High	H	QPSK	H	94	83	1/16	22.97
	28319.52	High	V	QPSK	V	88	126	1/16	21.48
	27534.84	Low	H	16QAM	H	93	72	1/16	21.61
	27534.84	Low	H	64QAM	H	93	72	1/16	19.09
MIMO	27534.84	Low	H	QPSK	H	93	72	1/16	22.00
	27534.84	Low	V	QPSK	V	83	125		
	27534.84	Low	H	16QAM	H	93	72	1/16	21.72
	27534.84	Low	V	16QAM	V	83	125		
	27534.84	Low	H	64QAM	H	93	72	1/16	19.07
	27534.84	Low	V	64QAM	V	83	125		

Table 7-14. Ant1 EIRP Data (Band n261 - 50MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27922.08	Mid	H	QPSK	V	99	65	32/0	20.38
	27922.08	Mid	V	QPSK	V	83	126	32/0	21.58
	27922.08	Mid	V	16QAM	V	83	126	1/16	20.20
	27922.08	Mid	V	64QAM	V	83	126	32/0	17.85
MIMO	27922.08	Mid	H	QPSK	V	99	65	32/0	21.50
	27922.08	Mid	V	QPSK	V	83	126		
	27922.08	Mid	H	16QAM	V	99	65	32/0	19.28
	27922.08	Mid	V	16QAM	V	83	126		
	27922.08	Mid	H	64QAM	V	99	65	32/0	17.33
	27922.08	Mid	V	64QAM	V	83	126		

Table 7-15. Ant1 EIRP Data (Band n261 - 50MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27559.32	Low	H	QPSK	H	94	75	1/32	23.74
	27559.32	Low	V	QPSK	V	81	124	1/32	23.77
	27923.52	Mid	H	QPSK	H	93	74	1/32	22.36
	27923.52	Mid	V	QPSK	V	81	125	1/32	23.44
	28292.16	High	H	QPSK	H	95	83	1/32	21.91
	28292.16	High	V	QPSK	V	84	122	1/32	22.60
	27559.32	Low	V	16QAM	V	81	124	1/32	21.91
	27923.52	Mid	V	64QAM	V	81	125	1/32	19.06
MIMO	27559.32	Low	H	QPSK	H	94	75	1/16	23.65
	27559.32	Low	V	QPSK	V	81	124		
	27559.32	Low	H	16QAM	H	94	75	1/16	20.73
	27559.32	Low	V	16QAM	V	81	124		
	27559.32	Low	H	64QAM	H	94	75	1/16	18.00
	27559.32	Low	V	64QAM	V	81	124		

Table 7-16. Ant1 EIRP Data (Band n261 - 100MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27923.52	Mid	H	QPSK	V	100	64	64/0	20.12
	27923.52	Mid	V	QPSK	V	82	126	64/0	23.51
	27923.52	Mid	V	16QAM	V	82	126	1/32	22.24
	27923.52	Mid	V	64QAM	V	82	126	1/32	20.25
MIMO	27923.52	Mid	H	QPSK	V	100	64	32/0	21.03
	27923.52	Mid	V	QPSK	V	82	126		
	27923.52	Mid	H	16QAM	V	100	64	32/0	19.57
	27923.52	Mid	V	16QAM	V	82	126		
	27923.52	Mid	H	64QAM	V	100	64	32/0	18.19
	27923.52	Mid	V	64QAM	V	82	126		

Table 7-17. Ant1 EIRP Data (Band n261 - 100MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27534.84	Low	H	QPSK	H	119	49	1/16	17.45
	27534.84	Low	V	QPSK	V	66	121	1/16	15.84
	27922.08	Mid	H	QPSK	H	148	33	1/16	15.21
	27922.08	Mid	V	QPSK	V	50	123	1/16	17.51
	28319.52	High	H	QPSK	H	116	49	1/16	18.23
	28319.52	High	V	QPSK	V	53	118	1/16	17.93
	28319.52	High	H	16QAM	H	116	49	1/16	16.09
	27534.84	Low	V	64QAM	V	66	121	1/16	14.95
MIMO	28319.52	High	H	QPSK	H	116	49	1/16	18.03
	28319.52	High	V	QPSK	V	53	118		
	28319.52	High	H	16QAM	H	116	49	1/16	15.26
	28319.52	High	V	16QAM	V	53	118		
	28319.52	High	H	64QAM	H	116	49	1/16	13.70
	28319.52	High	V	64QAM	V	53	118		

Table 7-18. Ant2 EIRP Data (Band n261 - 50MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27922.08	Mid	H	QPSK	H	150	36	1/16	17.56
	27922.08	Mid	V	QPSK	V	50	117	32/0	14.87
	27922.08	Mid	H	16QAM	H	150	36	32/0	15.72
	27922.08	Mid	H	64QAM	H	150	36	32/0	13.77
MIMO	27922.08	Mid	H	QPSK	H	150	36	1/16	17.25
	27922.08	Mid	V	QPSK	V	50	117		
	27922.08	Mid	H	16QAM	H	150	36	1/16	14.34
	27922.08	Mid	V	16QAM	V	50	117		
	27922.08	Mid	H	64QAM	H	150	36	1/16	13.02
	27922.08	Mid	V	64QAM	V	50	117		

Table 7-19. Ant2 EIRP Data (Band n261 - 50MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27559.32	Low	H	QPSK	H	118	48	1/32	18.32
	27559.32	Low	V	QPSK	V	60	121	1/32	18.17
	27923.52	Mid	H	QPSK	H	148	33	1/32	17.07
	27923.52	Mid	V	QPSK	V	51	124	1/32	18.95
	28292.16	High	H	QPSK	H	117	49	1/32	18.50
	28292.16	High	V	QPSK	V	54	119	1/32	17.80
	27559.32	Low	H	16QAM	H	118	48	1/32	17.22
	27559.32	Low	H	64QAM	H	118	48	1/32	16.55
MIMO	27923.52	Mid	H	QPSK	H	148	33	1/16	18.11
	27923.52	Mid	V	QPSK	V	51	124		
	27923.52	Mid	H	16QAM	H	148	33	1/16	15.20
	27923.52	Mid	V	16QAM	V	51	124		
	27923.52	Mid	H	64QAM	H	148	33	1/16	12.95
	27923.52	Mid	V	64QAM	V	51	124		

Table 7-20. Ant2 EIRP Data (Band n261 - 100MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27923.52	Mid	H	QPSK	H	151	33	1/0	17.81
	27923.52	Mid	V	QPSK	V	51	119	64/0	16.35
	27923.52	Mid	H	16QAM	H	151	33	64/0	16.05
	27923.52	Mid	H	64QAM	H	151	33	64/0	14.01
MIMO	27923.52	Mid	H	QPSK	H	151	33	1/16	17.76
	27923.52	Mid	V	QPSK	V	51	119		
	27923.52	Mid	H	16QAM	H	151	33	32/0	14.86
	27923.52	Mid	V	16QAM	V	51	119		
	27923.52	Mid	H	64QAM	H	151	33	32/0	12.51
	27923.52	Mid	V	64QAM	V	51	119		

Table 7-21. Ant2 EIRP Data (Band n261 - 100MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27534.84	Low	H	QPSK	H	256	322	1/16	20.51
	27534.84	Low	V	QPSK	V	170	129	1/16	21.02
	27922.08	Mid	H	QPSK	H	255	323	1/16	19.60
	27922.08	Mid	V	QPSK	V	165	133	1/16	19.15
	28319.52	High	H	QPSK	H	251	322	1/16	20.85
	28319.52	High	V	QPSK	V	160	130	1/16	21.11
	27534.84	Low	H	16QAM	H	256	322	1/16	19.74
	27534.84	Low	V	64QAM	V	170	129	1/16	17.45
MIMO	28319.52	High	H	QPSK	H	251	322	1/16	20.87
	28319.52	High	V	QPSK	V	160	130		
	28319.52	High	H	16QAM	H	251	322	1/16	18.85
	28319.52	High	V	16QAM	V	160	130		
	28319.52	High	H	64QAM	H	251	322	1/16	16.00
	28319.52	High	V	64QAM	V	160	130		

Table 7-22. Ant3 EIRP Data (Band n261 - 50MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27922.08	Mid	H	QPSK	H	76	37	32/0	19.02
	27922.08	Mid	V	QPSK	H	165	134	1/16	18.50
	27922.08	Mid	H	16QAM	H	76	37	32/0	17.44
	27922.08	Mid	H	64QAM	H	76	37	1/0	15.64
MIMO	27922.08	Mid	H	QPSK	H	76	37	1/16	20.74
	27922.08	Mid	V	QPSK	H	165	134		
	27922.08	Mid	H	16QAM	H	76	37	1/16	18.82
	27922.08	Mid	V	16QAM	H	165	134		
	27922.08	Mid	H	64QAM	H	76	37	1/16	15.78
	27922.08	Mid	V	64QAM	H	165	134		

Table 7-23. Ant3 EIRP Data (Band n261 - 50MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27559.32	Low	H	QPSK	H	255	322	1/32	21.11
	27559.32	Low	V	QPSK	V	171	130	1/32	21.31
	27923.52	Mid	H	QPSK	H	256	323	1/32	20.32
	27923.52	Mid	V	QPSK	V	166	132	1/32	20.05
	28292.16	High	H	QPSK	H	255	320	1/32	20.70
	28292.16	High	V	QPSK	V	160	131	1/32	21.43
	27559.32	Low	V	16QAM	V	171	130	1/32	19.35
	27559.32	Low	H	64QAM	H	255	322	1/32	17.71
MIMO	27559.32	Low	H	QPSK	H	255	322	1/16	21.14
	27559.32	Low	V	QPSK	V	171	130		
	27559.32	Low	H	16QAM	H	255	322	1/16	18.61
	27559.32	Low	V	16QAM	V	171	130		
	27559.32	Low	H	64QAM	H	255	322	1/16	16.62
	27559.32	Low	V	64QAM	V	171	130		

Table 7-24. Ant3 EIRP Data (Band n261 - 100MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27923.52	Mid	H	QPSK	H	74	36	64/0	19.36
	27923.52	Mid	V	QPSK	H	165	132	1/63	18.79
	27923.52	Mid	H	16QAM	H	74	36	64/0	17.79
	27923.52	Mid	H	64QAM	H	74	36	1/0	16.02
MIMO	27923.52	Mid	H	QPSK	H	74	36	32/0	19.21
	27923.52	Mid	V	QPSK	H	165	132		
	27923.52	Mid	H	16QAM	H	74	36	32/0	18.43
	27923.52	Mid	V	16QAM	H	165	132		
	27923.52	Mid	H	64QAM	H	74	36	32/0	16.81
	27923.52	Mid	V	64QAM	H	165	132		

Table 7-25. Ant3 EIRP Data (Band n261 - 100MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27534.84	Low	H	QPSK	H	91	30	1/16	20.08
	27534.84	Low	V	QPSK	V	103	32	1/16	21.05
	27922.08	Mid	H	QPSK	H	91	31	1/16	19.49
	27922.08	Mid	V	QPSK	V	102	33	1/16	19.57
	28319.52	High	H	QPSK	H	96	36	1/16	21.68
	28319.52	High	V	QPSK	V	105	33	1/16	20.63
	28319.52	High	H	16QAM	H	96	36	1/16	18.30
	28319.52	High	H	64QAM	H	96	36	1/16	16.98
MIMO	28319.52	High	H	QPSK	H	96	36	1/16	21.07
	28319.52	High	V	QPSK	V	105	33		
	28319.52	High	H	16QAM	H	96	36	1/16	18.62
	28319.52	High	V	16QAM	V	105	33		
	28319.52	High	H	64QAM	H	96	36	1/16	16.60
	28319.52	High	V	64QAM	V	105	33		

Table 7-26. Ant4 EIRP Data (Band n261 - 50MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27922.08	Mid	H	QPSK	V	278	325	32/0	19.11
	27922.08	Mid	V	QPSK	V	47	83	1/16	21.07
	27922.08	Mid	V	16QAM	V	47	83	1/16	19.84
	27922.08	Mid	V	64QAM	V	47	83	32/0	17.31
MIMO	27922.08	Mid	H	QPSK	V	278	325	32/0	20.06
	27922.08	Mid	V	QPSK	V	47	83		
	27922.08	Mid	H	16QAM	V	278	325	32/0	18.04
	27922.08	Mid	V	16QAM	V	47	83		
	27922.08	Mid	H	64QAM	V	278	325	32/0	15.55
	27922.08	Mid	V	64QAM	V	47	83		

Table 7-27. Ant4 EIRP Data (Band n261 - 50MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27559.32	Low	H	QPSK	H	97	29	1/32	20.50
	27559.32	Low	V	QPSK	V	104	33	1/32	21.10
	27923.52	Mid	H	QPSK	H	90	30	1/32	19.22
	27923.52	Mid	V	QPSK	V	102	32	1/32	20.05
	28292.16	High	H	QPSK	H	96	36	1/32	21.83
	28292.16	High	V	QPSK	V	102	32	1/32	20.09
	28292.16	High	H	16QAM	H	96	36	1/32	19.56
	28292.16	High	H	64QAM	H	96	36	1/32	17.77
MIMO	28292.16	High	H	QPSK	H	96	36	1/16	20.91
	28292.16	High	V	QPSK	V	102	32		
	28292.16	High	H	16QAM	H	96	36	1/16	17.96
	28292.16	High	V	16QAM	V	102	32		
	28292.16	High	H	64QAM	H	96	36	1/16	15.59
	28292.16	High	V	64QAM	V	102	32		

Table 7-28. Ant4 EIRP Data (Band n261 - 100MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	27923.52	Mid	H	QPSK	V	277	325	1/63	19.84
	27923.52	Mid	V	QPSK	V	46	83	1/32	22.04
	27923.52	Mid	V	16QAM	V	46	83	1/63	20.93
	27923.52	Mid	V	64QAM	V	46	83	1/63	18.48
MIMO	27923.52	Mid	H	QPSK	V	277	325	1/0	20.89
	27923.52	Mid	V	QPSK	V	46	83		
	27923.52	Mid	H	16QAM	V	277	325	1/31	19.37
	27923.52	Mid	V	16QAM	V	46	83		
	27923.52	Mid	H	64QAM	V	277	325	1/31	16.50
	27923.52	Mid	V	64QAM	V	46	83		

Table 7-29. Ant4 EIRP Data (Band n261 - 100MHz-2CC)

Band n260 Beam ID Configurations

Mode	Beam Polarization	Beam ID
SISO	H	167
	V	26
MIMO	H	169
	V	41

Table 7-30. Ant1 Worst Case Beam ID

Mode	Beam Polarization	Beam ID
SISO	H	137
	V	8
MIMO	H	146
	V	18

Table 7-31. Ant2 Worst Case Beam ID

Mode	Beam Polarization	Beam ID
SISO	H	164
	V	36
MIMO	H	176
	V	48

Table 7-32. Ant3 Worst Case Beam ID

Mode	Beam Polarization	Beam ID
SISO	H	159
	V	30
MIMO	H	172
	V	44

Table 7-33. Ant4 Worst Case Beam ID

Band n260

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	37027.32	Low	H	QPSK	H	118	100	1/16	19.40
	37027.32	Low	V	QPSK	V	89	70	1/16	19.54
	38497.44	Mid	H	QPSK	H	112	54	1/16	20.94
	38497.44	Mid	V	QPSK	V	89	60	1/16	19.44
	39966.24	High	H	QPSK	H	124	100	1/16	18.81
	39966.24	High	V	QPSK	V	90	39	1/16	20.40
	38497.44	Mid	H	16QAM	H	112	54	1/16	18.80
	38497.44	Mid	V	64QAM	V	89	60	1/16	16.94
MIMO	38497.44	Mid	H	QPSK	H	112	54	1/16	20.22
	38497.44	Mid	V	QPSK	V	89	60		
	38497.44	Mid	H	16QAM	H	112	54	1/16	18.27
	38497.44	Mid	V	16QAM	V	89	60		
	38497.44	Mid	H	64QAM	H	112	54	1/16	16.61
	38497.44	Mid	V	64QAM	V	89	60		

Table 7-34. Ant1 EIRP Data (Band n260 - 50MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	38497.44	Mid	H	QPSK	V	112	57	32/0	18.08
	38497.44	Mid	V	QPSK	V	89	52	32/0	18.12
	38497.44	Mid	H	16QAM	V	112	57	1/16	16.53
	38497.44	Mid	V	64QAM	V	89	52	1/31	14.88
MIMO	38497.44	Mid	H	QPSK	V	112	57	32/0	18.06
	38497.44	Mid	V	QPSK	V	89	52		
	38497.44	Mid	H	16QAM	V	112	57	32/0	15.31
	38497.44	Mid	V	16QAM	V	89	52		
	38497.44	Mid	H	64QAM	V	112	57	32/0	13.94
	38497.44	Mid	V	64QAM	V	89	52		

Table 7-35. Ant1 EIRP Data (Band n260 - 50MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	37051.80	Low	H	QPSK	H	114	93	1/32	20.22
	37051.80	Low	V	QPSK	V	86	69	1/32	19.74
	38498.88	Mid	H	QPSK	H	109	53	1/32	21.21
	38498.88	Mid	V	QPSK	V	89	87	1/0	20.19
	39949.92	High	H	QPSK	H	35	116	64/0	17.33
	39949.92	High	V	QPSK	V	91	36	1/32	20.97
	38498.88	Mid	H	16QAM	H	109	53	1/32	19.37
	38498.88	Mid	H	64QAM	H	109	53	1/32	17.06
MIMO	38498.88	Mid	H	QPSK	H	109	53	1/0	21.34
	38498.88	Mid	V	QPSK	V	89	87		
	38498.88	Mid	H	16QAM	H	109	53	1/0	18.16
	38498.88	Mid	V	16QAM	V	89	87		
	38498.88	Mid	H	64QAM	H	109	53	1/0	15.38
	38498.88	Mid	V	64QAM	V	89	87		

Table 7-36. Ant1 EIRP Data (Band n260 - 100MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	38498.88	Mid	H	QPSK	V	111	56	64/0	17.91
	38498.88	Mid	V	QPSK	V	91	52	64/0	18.43
	38498.88	Mid	V	16QAM	V	91	52	1/32	17.05
	38498.88	Mid	V	64QAM	V	91	52	1/32	15.59
MIMO	38498.88	Mid	H	QPSK	V	111	56	32/0	19.06
	38498.88	Mid	V	QPSK	V	91	52		
	38498.88	Mid	H	16QAM	V	111	56	1/0	16.60
	38498.88	Mid	V	16QAM	V	91	52		
	38498.88	Mid	H	64QAM	V	111	56	1/0	14.34
	38498.88	Mid	V	64QAM	V	91	52		

Table 7-37. Ant1 EIRP Data (Band n260 - 100MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	37027.32	Low	H	QPSK	H	53	91	1/16	16.51
	37027.32	Low	V	QPSK	V	99	260	1/16	17.27
	38497.44	Mid	H	QPSK	H	51	78	1/16	18.58
	38497.44	Mid	V	QPSK	V	113	266	1/16	16.79
	39966.24	High	H	QPSK	H	51	78	1/16	17.48
	39966.24	High	V	QPSK	V	163	234	1/16	15.86
	38497.44	Mid	H	16QAM	H	51	78	1/16	16.59
	38497.44	Mid	H	64QAM	H	51	78	1/16	13.89
MIMO	38497.44	Mid	H	QPSK	H	51	78	1/16	18.76
	38497.44	Mid	V	QPSK	V	113	266		
	38497.44	Mid	H	16QAM	H	51	78	1/16	15.69
	38497.44	Mid	V	16QAM	V	113	266		
	38497.44	Mid	H	64QAM	H	51	78	1/16	12.45
	38497.44	Mid	V	64QAM	V	113	266		

Table 7-38. Ant2 EIRP Data (Band n260 - 50MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	38497.44	Mid	H	QPSK	H	116	95	1/16	17.29
	38497.44	Mid	V	QPSK	V	108	272	1/16	14.85
	38497.44	Mid	H	16QAM	H	116	95	1/16	15.24
	38497.44	Mid	H	64QAM	H	116	95	1/16	13.53
MIMO	38497.44	Mid	H	QPSK	H	116	95	1/16	17.66
	38497.44	Mid	V	QPSK	V	108	272		
	38497.44	Mid	H	16QAM	H	116	95	1/16	14.36
	38497.44	Mid	V	16QAM	V	108	272		
	38497.44	Mid	H	64QAM	H	116	95	1/16	11.71
	38497.44	Mid	V	64QAM	V	108	272		

Table 7-39. Ant2 EIRP Data (Band n260 - 50MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	37051.80	Low	H	QPSK	H	51	89	1/32	16.66
	37051.80	Low	V	QPSK	V	102	260	1/32	18.51
	38498.88	Mid	H	QPSK	H	66	90	1/32	17.08
	38498.88	Mid	V	QPSK	V	113	267	1/32	17.31
	39949.92	High	H	QPSK	H	50	79	1/32	17.29
	39949.92	High	V	QPSK	V	161	240	1/32	16.04
	38498.88	Mid	V	16QAM	V	113	267	1/32	16.10
	37051.80	Low	V	64QAM	V	102	260	1/32	13.65
MIMO	37051.80	Low	H	QPSK	H	51	89	1/0	18.57
	37051.80	Low	V	QPSK	V	102	260		
	37051.80	Low	H	16QAM	H	51	89	1/0	15.19
	37051.80	Low	V	16QAM	V	102	260		
	37051.80	Low	H	64QAM	H	51	89	1/0	12.56
	37051.80	Low	V	64QAM	V	102	260		

Table 7-40. Ant2 EIRP Data (Band n260 - 100MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	38498.88	Mid	H	QPSK	H	68	22	1/32	15.64
	38498.88	Mid	V	QPSK	V	102	274	1/0	16.49
	38498.88	Mid	V	16QAM	V	102	274	1/0	15.37
	38498.88	Mid	V	64QAM	V	102	274	1/0	14.36
MIMO	38498.88	Mid	H	QPSK	H	68	22	1/0	17.01
	38498.88	Mid	V	QPSK	V	102	274		
	38498.88	Mid	H	16QAM	H	68	22	32/0	14.89
	38498.88	Mid	V	16QAM	V	102	274		
	38498.88	Mid	H	64QAM	H	68	22	32/0	12.89
	38498.88	Mid	V	64QAM	V	102	274		

Table 7-41. Ant2 EIRP Data (Band n260 - 100MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	37027.32	Low	H	QPSK	H	342	59	1/16	20.31
	37027.32	Low	V	QPSK	V	35	312	1/31	20.39
	38497.44	Mid	H	QPSK	H	351	56	1/0	21.74
	38497.44	Mid	V	QPSK	V	29	310	1/0	21.94
	39966.24	High	H	QPSK	H	204	294	1/16	21.08
	39966.24	High	V	QPSK	V	28	329	1/0	19.35
	38497.44	Mid	H	16QAM	H	351	56	1/16	20.42
	38497.44	Mid	H	64QAM	H	351	56	1/16	18.21
MIMO	38497.44	Mid	H	QPSK	H	351	56	1/16	21.79
	38497.44	Mid	V	QPSK	V	29	310		
	38497.44	Mid	H	16QAM	H	351	56	1/16	21.12
	38497.44	Mid	V	16QAM	V	29	310		
	38497.44	Mid	H	64QAM	H	351	56	1/16	19.22
	38497.44	Mid	V	64QAM	V	29	310		

Table 7-42. Ant3 EIRP Data (Band n260 - 50MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	38497.44	Mid	H	QPSK	V	353	51	1/31	21.88
	38497.44	Mid	V	QPSK	V	32	323	32/0	21.00
	38497.44	Mid	H	16QAM	V	353	51	1/31	20.20
	38497.44	Mid	H	64QAM	V	353	51	1/31	18.36
MIMO	38497.44	Mid	H	QPSK	V	353	51	1/31	22.71
	38497.44	Mid	V	QPSK	V	32	323		
	38497.44	Mid	H	16QAM	V	353	51	1/31	20.61
	38497.44	Mid	V	16QAM	V	32	323		
	38497.44	Mid	H	64QAM	V	353	51	1/31	17.48
	38497.44	Mid	V	64QAM	V	32	323		

Table 7-43. Ant3 EIRP Data (Band n260 - 50MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	37051.80	Low	H	QPSK	H	206	50	1/32	21.03
	37051.80	Low	V	QPSK	V	35	312	1/32	22.07
	38498.88	Mid	H	QPSK	H	195	302	1/32	22.32
	38498.88	Mid	V	QPSK	V	34	312	1/32	21.93
	39949.92	High	H	QPSK	H	195	297	1/32	21.03
	39949.92	High	V	QPSK	V	27	333	1/32	21.43
	38498.88	Mid	V	16QAM	V	34	312	1/32	20.81
	38498.88	Mid	V	64QAM	V	34	312	1/32	18.73
MIMO	38498.88	Mid	H	QPSK	H	195	302	1/31	22.27
	38498.88	Mid	V	QPSK	V	34	312		
	38498.88	Mid	H	16QAM	H	195	302	1/31	19.87
	38498.88	Mid	V	16QAM	V	34	312		
	38498.88	Mid	H	64QAM	H	195	302	1/31	17.54
	38498.88	Mid	V	64QAM	V	34	312		

Table 7-44. Ant3 EIRP Data (Band n260 - 100MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	38498.88	Mid	H	QPSK	V	351	54	1/32	23.17
	38498.88	Mid	V	QPSK	V	32	320	1/32	21.30
	38498.88	Mid	H	16QAM	V	351	54	1/32	21.85
	38498.88	Mid	H	64QAM	V	351	54	64/0	19.66
MIMO	38498.88	Mid	H	QPSK	V	351	54	1/16	23.49
	38498.88	Mid	V	QPSK	V	32	320		
	38498.88	Mid	H	16QAM	V	351	54	32/0	20.66
	38498.88	Mid	V	16QAM	V	32	320		
	38498.88	Mid	H	64QAM	V	351	54	32/0	18.02
	38498.88	Mid	V	64QAM	V	32	320		

Table 7-45. Ant3 EIRP Data (Band n260 - 100MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	37027.32	Low	H	QPSK	H	35	50	1/16	22.74
	37027.32	Low	V	QPSK	V	69	40	1/16	21.48
	38497.44	Mid	H	QPSK	H	35	75	1/16	23.24
	38497.44	Mid	V	QPSK	V	102	35	1/16	23.99
	39966.24	High	H	QPSK	H	38	77	1/16	21.16
	39966.24	High	V	QPSK	V	102	21	1/16	21.14
	38497.44	Mid	V	16QAM	V	102	35	1/0	21.70
	38497.44	Mid	V	64QAM	V	102	35	1/0	19.67
MIMO	38497.44	Mid	H	QPSK	H	35	75	1/16	24.55
	38497.44	Mid	V	QPSK	V	102	35		
	38497.44	Mid	H	16QAM	H	35	75	1/0	21.57
	38497.44	Mid	V	16QAM	V	102	35		
	38497.44	Mid	H	64QAM	H	35	75	1/0	18.54
	38497.44	Mid	V	64QAM	V	102	35		

Table 7-46. Ant4 EIRP Data (Band n260 - 50MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	38497.44	Mid	H	QPSK	V	29	78	32/0	23.15
	38497.44	Mid	V	QPSK	H	279	320	32/0	21.57
	38497.44	Mid	H	16QAM	V	29	78	1/31	21.79
	38497.44	Mid	H	64QAM	V	29	78	1/31	19.69
MIMO	38497.44	Mid	H	QPSK	V	29	78	1/16	23.53
	38497.44	Mid	V	QPSK	H	279	320		
	38497.44	Mid	H	16QAM	V	29	78	1/31	20.82
	38497.44	Mid	V	16QAM	H	279	320		
	38497.44	Mid	H	64QAM	V	29	78	32/0	18.00
	38497.44	Mid	V	64QAM	H	279	320		

Table 7-47. Ant4 EIRP Data (Band n260 - 50MHz-2CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	37051.80	Low	H	QPSK	V	36	48	1/32	23.34
	37051.80	Low	V	QPSK	H	69	37	1/32	21.99
	38498.88	Mid	H	QPSK	V	30	71	1/32	23.63
	38498.88	Mid	V	QPSK	H	102	32	1/32	24.24
	39949.92	High	H	QPSK	V	39	75	1/32	20.93
	39949.92	High	V	QPSK	H	102	19	1/32	21.08
	38498.88	Mid	V	16QAM	H	102	32	1/32	21.99
	38498.88	Mid	V	64QAM	H	102	32	1/32	19.87
MIMO	38498.88	Mid	H	QPSK	V	30	71	1/0	24.90
	38498.88	Mid	V	QPSK	H	102	32		
	38498.88	Mid	H	16QAM	V	30	71	1/0	21.75
	38498.88	Mid	V	16QAM	H	102	32		
	38498.88	Mid	H	64QAM	V	30	71	1/0	18.91
	38498.88	Mid	V	64QAM	H	102	32		

Table 7-48. Ant4 EIRP Data (Band n260 - 100MHz-1CC)

Mode	Frequency [MHz]	Channel	Beam Pol	Modulation	Ant. Pol. [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	RB Size/Offset	EIRP [dBm]
SISO	38498.88	Mid	H	QPSK	V	29	75	64/0	23.39
	38498.88	Mid	V	QPSK	H	279	328	1/63	22.28
	38498.88	Mid	H	16QAM	V	29	75	1/32	21.94
	38498.88	Mid	H	64QAM	V	29	75	64/0	19.85
MIMO	38498.88	Mid	H	QPSK	V	29	75	1/16	24.24
	38498.88	Mid	V	QPSK	H	279	328		
	38498.88	Mid	H	16QAM	V	29	75	32/0	21.06
	38498.88	Mid	V	16QAM	H	279	328		
	38498.88	Mid	H	64QAM	V	29	75	32/0	18.41
	38498.88	Mid	V	64QAM	H	279	328		

Table 7-49. Ant4 EIRP Data (Band n260 - 100MHz-2CC)

7.4 Radiated Spurious and Harmonic Emissions

§2.1051, §30.203

Test Overview

The spectrum is scanned from 30MHz to 100GHz for n261 and from 30MHz to 200GHz for n260. All out of band emissions are measured in a radiated test setup while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All modulations were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

The conductive power or total radiated power of any emissions outside a licensee's frequency block shall be -13dBm/1MHz.

Test Procedure Used

ANSI C63.26-2015 Section 5.7.4
KDB 842590 D01 v01 Section 4.4.2 and Section 4.4.3

Test Settings

1. Start frequency was set to 30MHz and stop frequency was set to 100 GHz for n261 and 200GHz for n260. Several plots are used to show investigations in this entire span.
2. Detector = RMS
3. Trace mode = trace average
4. Sweep time = auto couple
5. Number of sweep points ≥ 2 x Span/RBW
6. The trace was allowed to stabilize
7. RBW = 1MHz, VBW = 3MHz

Test Notes

1) The EUT was tested in three orthogonal planes 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) All radiated spurious emissions were measured as EIRP to compare with the §30.203 TRP limits.

3) 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.

4) The plots from 1-200GHz show corrected average EIRP levels. Plots below 1GHz are corrected field strength levels. The average EIRP reported below is calculated per section 5.2.7 of ANSI C63.26-2015 which states: EIRP (dBm) = E (dBμV/m) + 20log(D) − 104.8; where D is the measurement distance (in the far field region) in m. The field strength E is calculated E (dBμV/m) = Spectrum Analyzer Level (dBm) + Antenna Factor (dB/m) + Cable Loss (dB) + Harmonic Mixer Conversion Loss (dB) + 107. All appropriate Antenna Factor and Cable Loss have been applied in the spectrum analyzer for each measurement. For measurements > 40GHz, Harmonic Mixer Conversion Loss was also applied to the spectrum analyzer.

5) Emissions below 18GHz were measured at a 3 meter test distance, while emissions above 18GHz were measured at the appropriate far field distance. The far field of the mmWave signal is based on formula: R > 2D^2/wavelength, where D is the larger between the dimension of the measurement antenna and the transmitting antenna of the EUT. In this case, D is the largest dimension of the measurement antenna.

Frequency Range (GHz)	Wavelength(cm)	Far Field Distance (m)	Measurement Distance (m)
18-40	0.749	0.54	1.00
40-60	0.500	1.39	1.50
60-90	0.333	0.91	1.00
90-140	0.214	0.58	1.00
140-200	0.150	0.39	1.00

Table 7-50. Far-Field Distance & Measurement Distance per Frequency Range

6) All emissions from 30MHz - 60GHz were measured using a spectrum analyzer with an internal preamplifier. Emissions >60GHz were measured using a harmonic mixer with the spectrum analyzer.

7) All RSE's were measured with 1CC. It was determined that adding more CC's causes the overall amplitude of just 1CC to decrease, therefore, 1CC is the worst case for the purposes of spurious emissions measurements.

8) The "-" shown in the following RSE tables are used to denote a noise floor measurement.

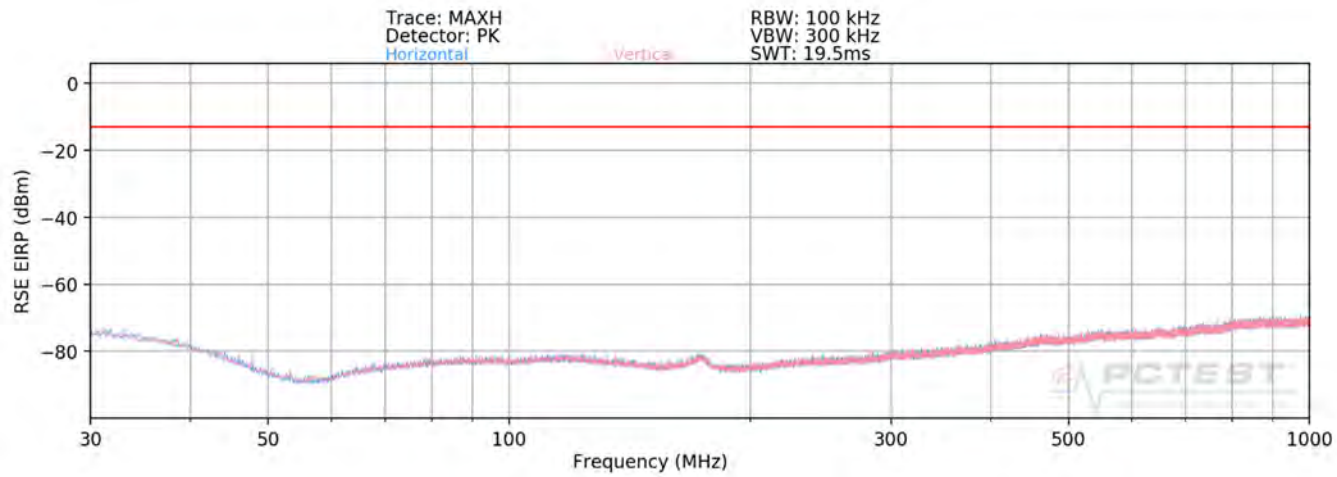
9) All RSE's were investigated in EN-DC mode and with 802.11 chipset active. It was determined that there is no new emission introduced by EN-DC mode, or the 802.11 chipset. For EN-DC mode, n261 uses LTE B13, B5, B4, B66 and B2, and n260 uses LTE B12, B13, B5, B4, B66, B2 and B30.

10) There was no discernible difference in the spurious emission levels when using different LTE anchor bands. Thus, LTE Band 2 was used as a representative anchor band for EN-DC investigations.

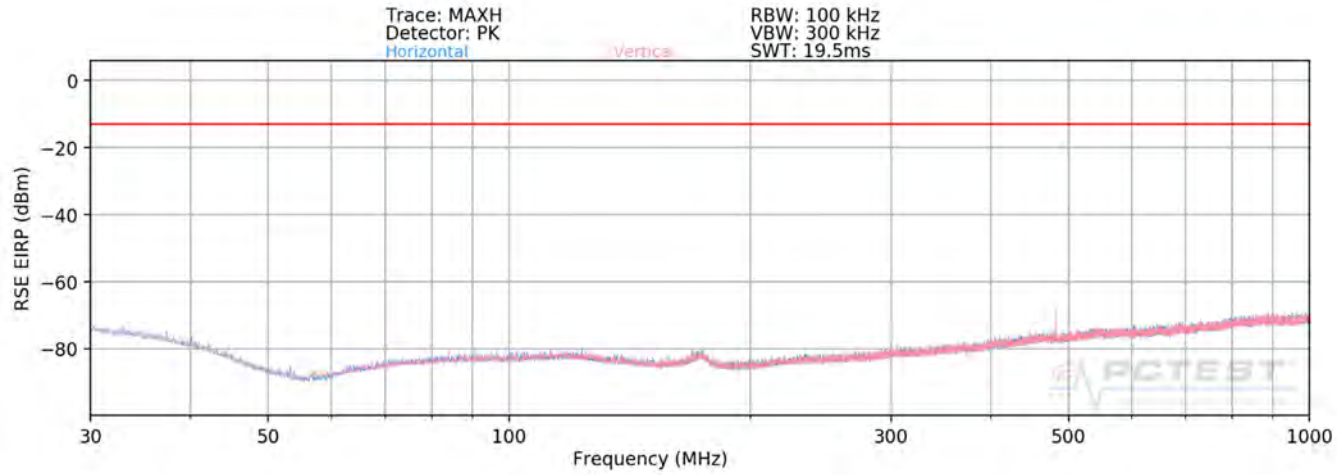
11) For the n261 band spurious emission measurements, the spectrum directly below the fundamental frequency is investigated from 18 - 27.375GHz and the spectrum directly above the fundamental frequency is investigated from 28.475 - 40GHz. The portion of spectrum from 27.375 – 27.5GHz and 28.35 - 28.475GHz is shown Section 7.5 which covers band edge emissions.

12) For the n260 band spurious emission measurements, the spectrum directly below the fundamental frequency is investigated from 18 - 36.85GHz and the spectrum directly above the fundamental frequency is investigated from 40.15 - 60GHz. The portion of spectrum from 36.85 - 40GHz and 40 - 40.15GHz is shown Section 7.5 which covers band edge emissions.

Band n261 – Ant1
30MHz - 1GHz

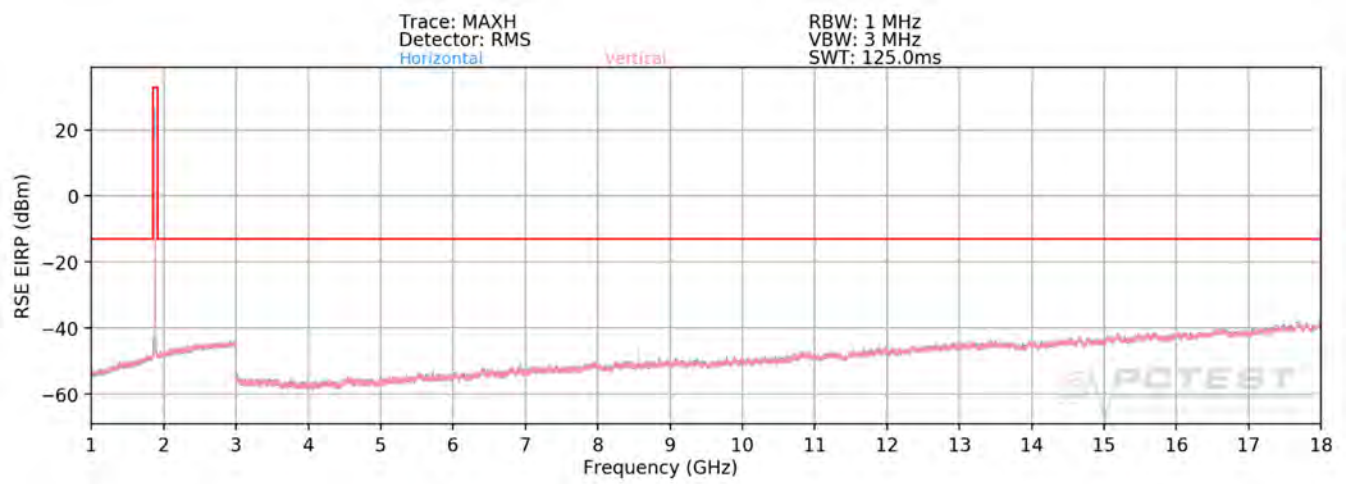


Plot 7-97. Ant1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam)

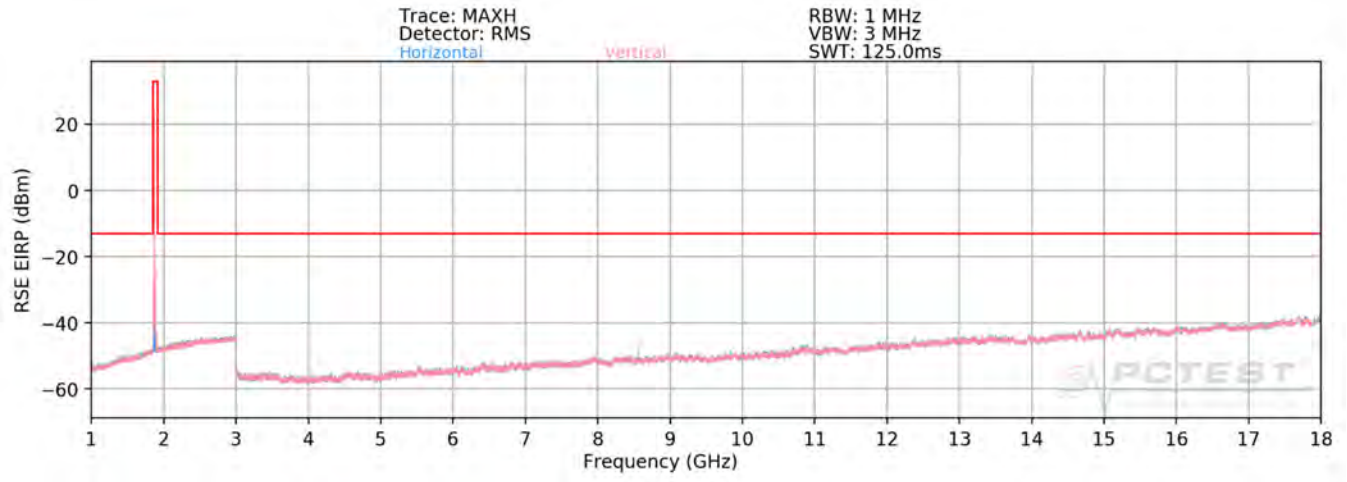


Plot 7-98. Ant1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam)

1GHz - 18GHz



Plot 7-99. Ant1-n261 Radiated Spurious Plot 1GHz - 18GHz (1CC QPSK Mid Channel H Beam – ENDC Anchor Band 2)



Plot 7-100. Ant1-n261 Radiated Spurious Plot 1GHz - 18GHz (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Antenna Height [cm]	Turntable Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8821.85	Low	50	H	QPSK	H	272	5	-41.24	-13.00	-28.24
8821.85	Low	50	V	QPSK	H	288	9	-42.74	-13.00	-29.74
8569.16	Mid	50	H	QPSK	H	285	23	-43.36	-13.00	-30.36
8569.16	Mid	50	V	QPSK	H	284	14	-43.34	-13.00	-30.34
8966.56	High	50	H	QPSK	H	289	9	-42.48	-13.00	-29.48
8966.56	High	50	V	QPSK	H	290	359	-43.62	-13.00	-30.62

Table 7-51. Ant1 - SISO -Spurious Emissions Table (1GHz - 18GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-38.92	-13.00	-25.92
Mid	50	QPSK	-40.34	-13.00	-27.34
High	50	QPSK	-40.00	-13.00	-27.00

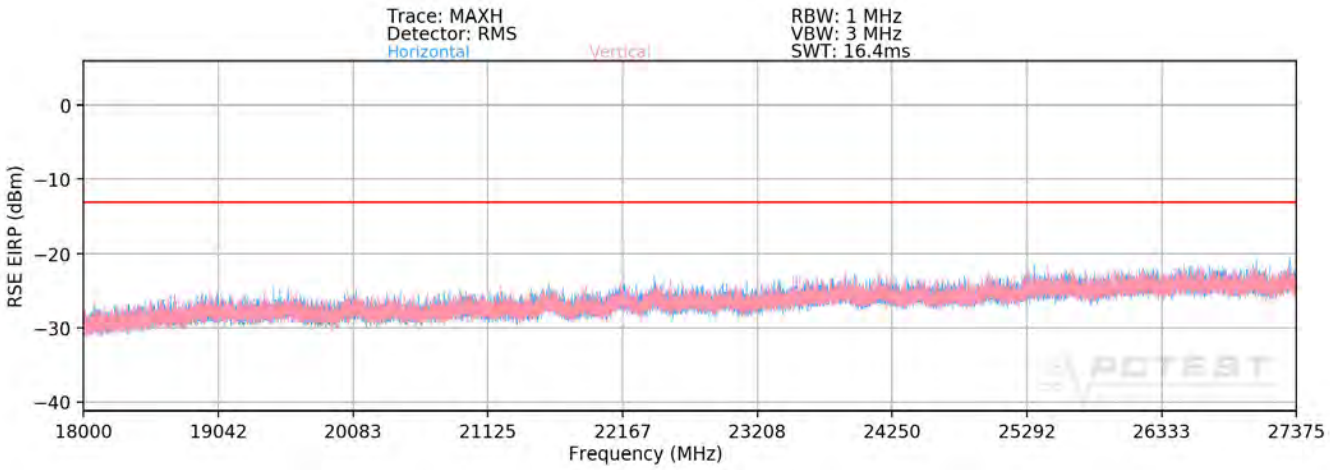
Table 7-52. Ant1 - MIMO -Spurious Emissions Table (1GHz - 18GHz)

Notes

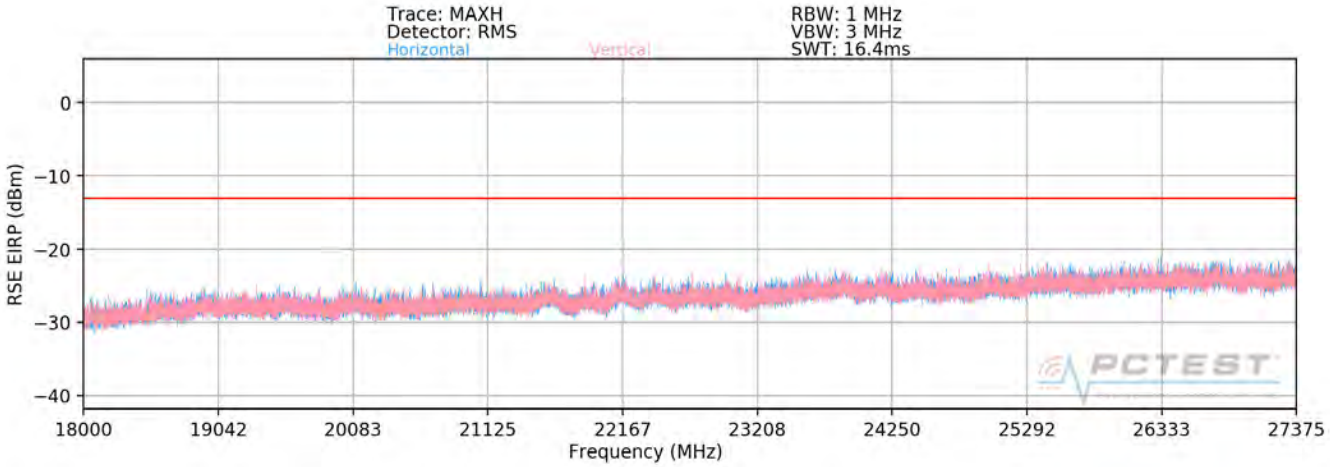
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

18GHz - 27.375GHz



Plot 7-101. Ant1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam – ENDC Anchor B2)



Plot 7-102. Ant1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
27228.39	Low	50	H	QPSK	V	89	79	-27.51	-13.00	-14.51
27381.83	Low	50	V	QPSK	V	88	74	-33.10	-13.00	-20.10
27307.85	Mid	50	H	QPSK	V	97	80	-35.46	-13.00	-22.46
27385.32	Mid	50	V	QPSK	V	91	74	-34.67	-13.00	-21.67
26477.22	High	50	H	QPSK	V	94	74	-35.49	-13.00	-22.49
25584.11	High	50	V	QPSK	V	90	62	-36.00	-13.00	-23.00

Table 7-53. Ant1 - SISO -Spurious Emissions Table (18GHz - 27.375GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-26.45	-13.00	-13.45
Mid	50	QPSK	-32.04	-13.00	-19.04
High	50	QPSK	-32.73	-13.00	-19.73

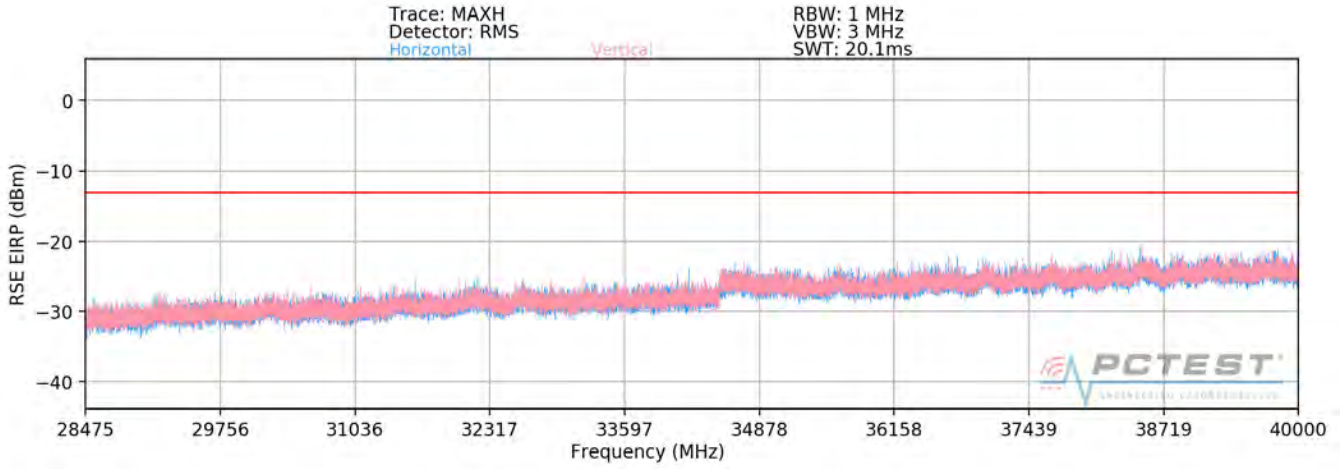
Table 7-54. Ant1 - MIMO -Spurious Emissions Table (18GHz - 27.375GHz)

Notes

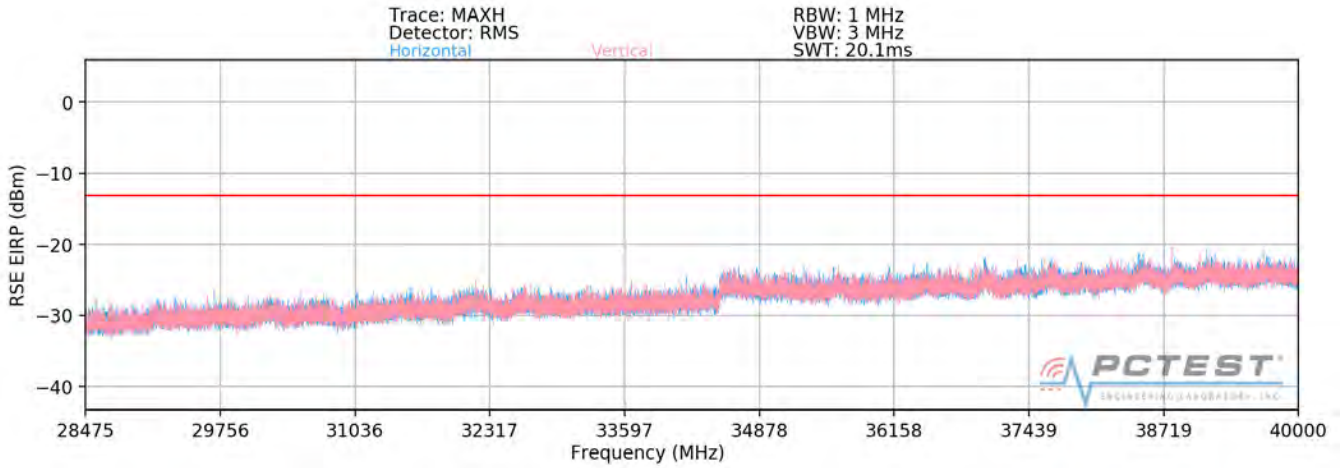
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

28.475GHz - 40GHz



Plot 7-103. Ant1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam – ENDC Anchor B2)



Plot 7-104. Ant1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
28605.69	Low	50	H	QPSK	V	104	65	-23.53	-13.00	-10.53
28605.34	Low	50	V	QPSK	V	129	68	-25.70	-13.00	-12.70
30138.10	Mid	50	H	QPSK	V	109	68	-30.10	-13.00	-17.10
30137.75	Mid	50	V	QPSK	V	132	61	-30.09	-13.00	-17.09
29740.61	High	50	H	QPSK	V	104	74	-26.58	-13.00	-13.58
29740.61	High	50	V	QPSK	V	131	60	-27.82	-13.00	-14.82

Table 7-55. Ant1 - SISO -Spurious Emissions Table (28.475GHz - 40GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-21.47	-13.00	-8.47
Mid	50	QPSK	-27.08	-13.00	-14.08
High	50	QPSK	-24.14	-13.00	-11.14

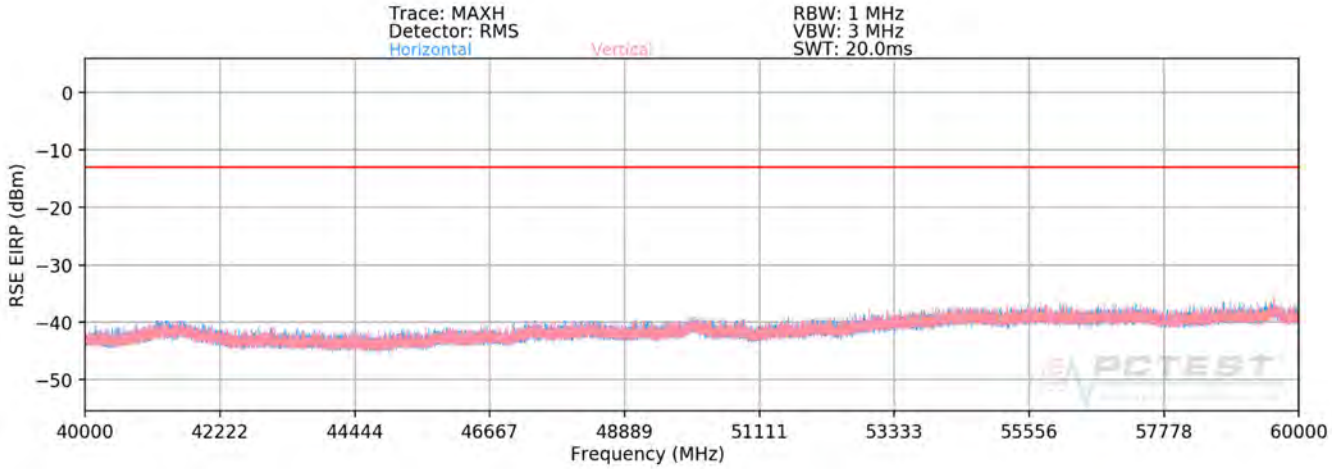
Table 7-56. Ant1 - MIMO -Spurious Emissions Table (28.475GHz - 40GHz)

Notes

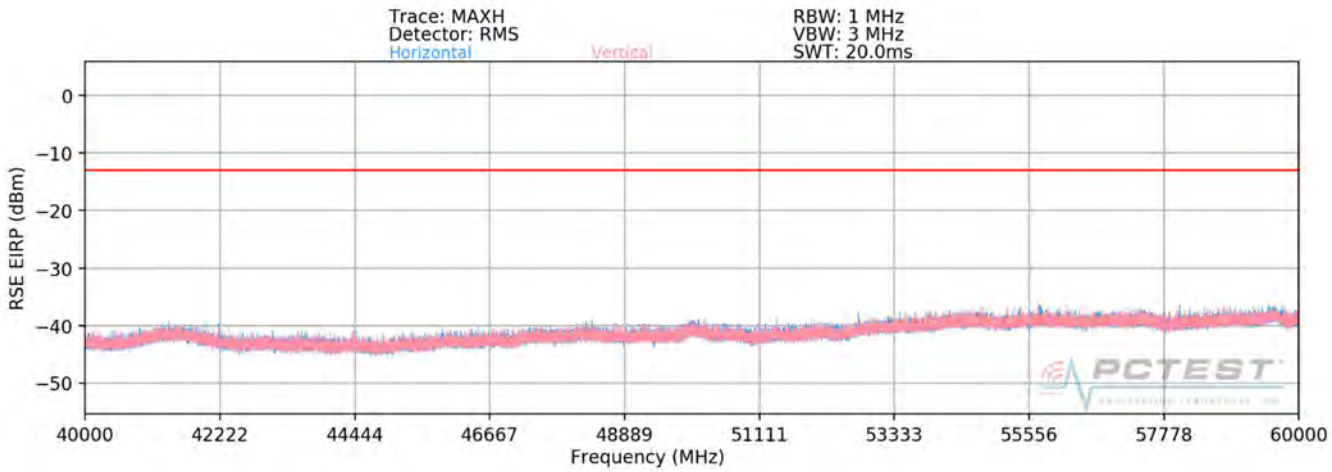
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

40GHz - 60GHz



Plot 7-105. Ant1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam – ENDC Anchor B2)



Plot 7-106. Ant1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1.5 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
55070.82	Low	50	H	QPSK	V	78	281	-53.71	-13.00	-40.71
55070.83	Low	50	V	QPSK	V	23	255	-50.18	-13.00	-37.18
55845.18	Mid	50	H	QPSK	V	85	322	-50.49	-13.00	-37.49
55845.50	Mid	50	V	QPSK	V	15	239	-52.22	-13.00	-39.22
56640.44	High	50	H	QPSK	V	250	108	-54.19	-13.00	-41.19
56640.24	High	50	V	QPSK	V	76	327	-52.71	-13.00	-39.71

Table 7-57. Ant1 - SISO -Spurious Emissions Table (40GHz - 60GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-48.58	-13.00	-35.58
Mid	50	QPSK	-48.26	-13.00	-35.26
High	50	QPSK	-50.38	-13.00	-37.38

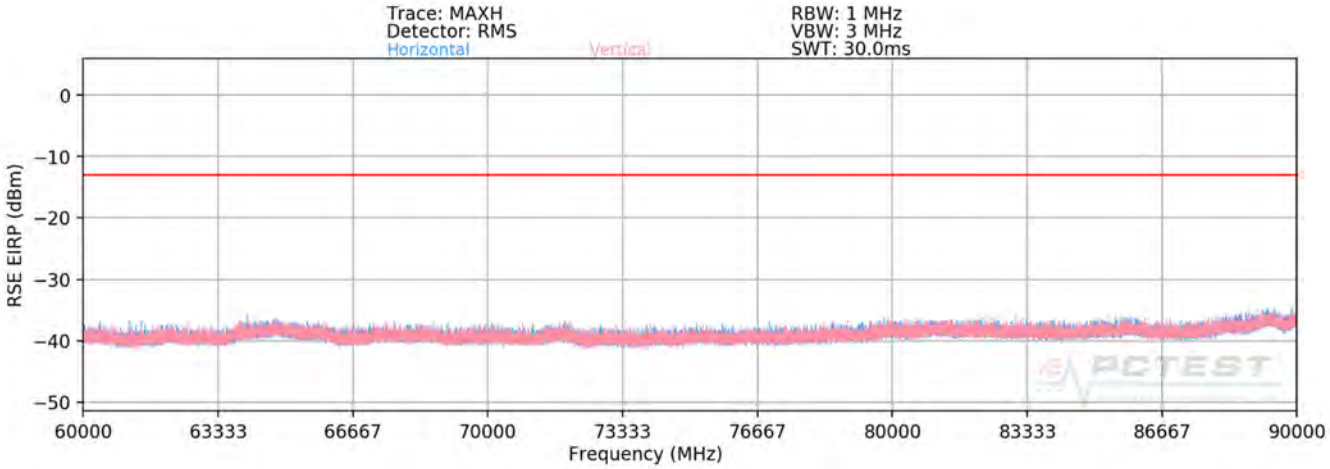
Table 7-58. Ant1 - MIMO -Spurious Emissions Table (40GHz - 60GHz)

Notes

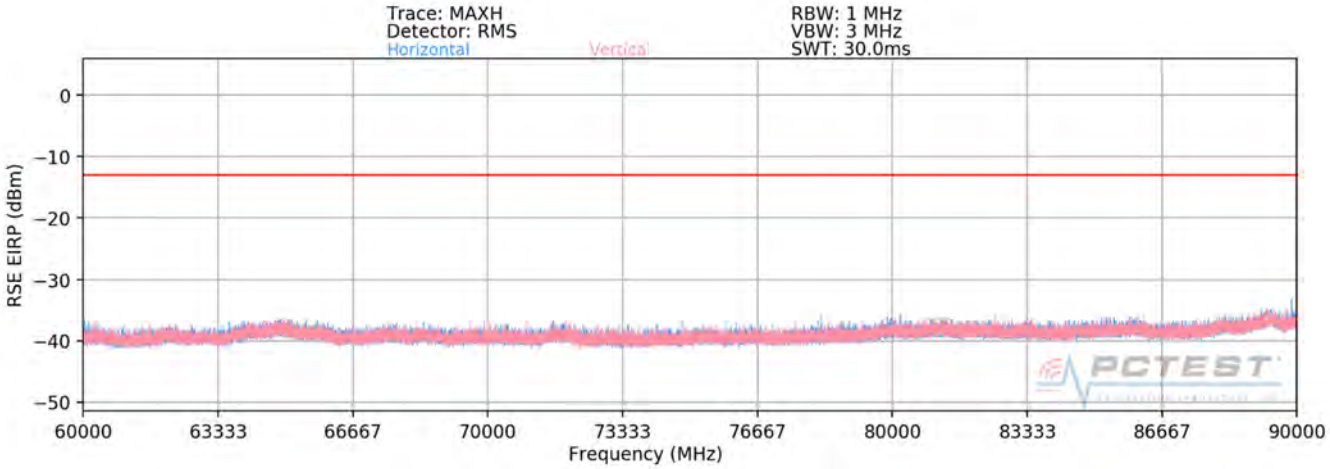
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

60GHz - 90GHz



Plot 7-107. Ant1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam – ENDC Anchor B2)



Plot 7-108. Ant1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
82600.92	Low	50	H	QPSK	H	-	-	-51.57	-13.00	-38.57
82606.68	Low	50	V	QPSK	H	24	209	-50.61	-13.00	-37.61
83768.01	Mid	50	H	QPSK	H	257	120	-51.05	-13.00	-38.05
83768.70	Mid	50	V	QPSK	H	94	302	-51.09	-13.00	-38.09
84952.62	High	50	H	QPSK	H	-	-	-51.35	-13.00	-38.35
84961.26	High	50	V	QPSK	H	37	16	-51.06	-13.00	-38.06

Table 7-59. Ant1 - SISO -Spurious Emissions Table (60GHz - 90GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-48.05	-13.00	-35.05
Mid	50	QPSK	-48.06	-13.00	-35.06
High	50	QPSK	-48.19	-13.00	-35.19

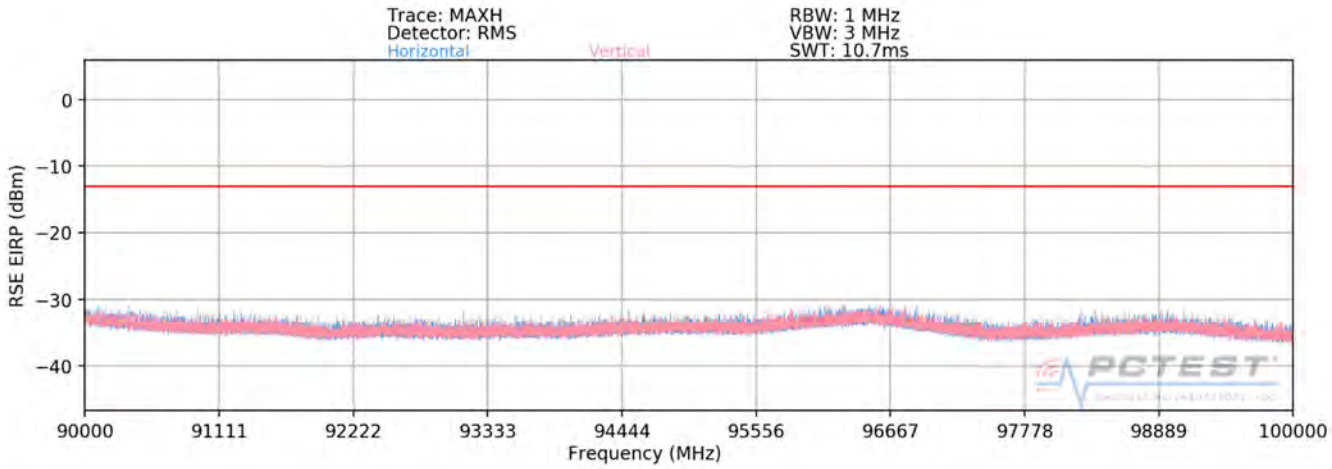
Table 7-60. Ant1 - MIMO -Spurious Emissions Table (60GHz - 90GHz)

Notes

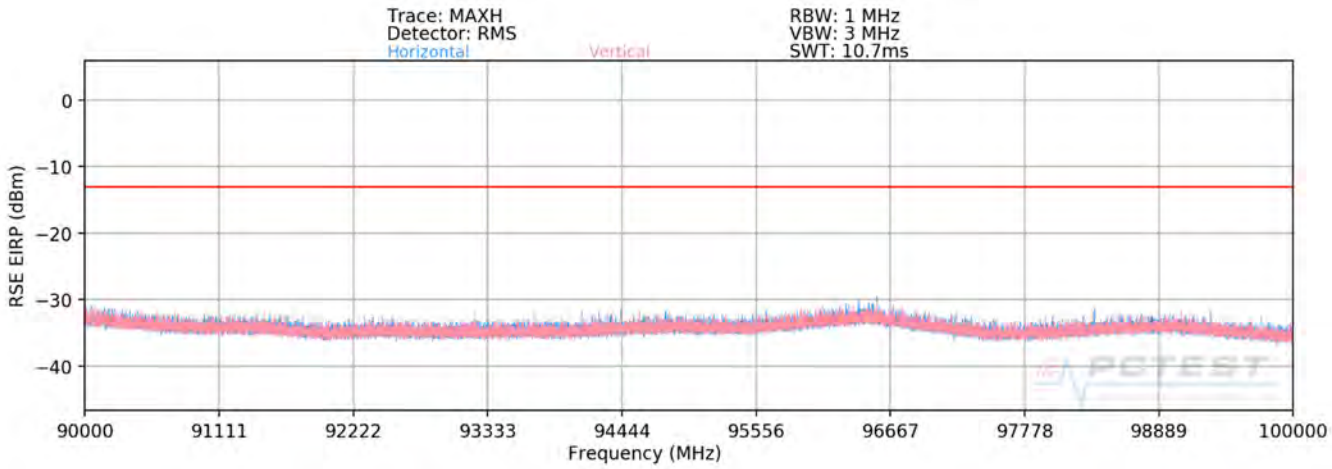
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

90GHz - 100GHz



Plot 7-109. Ant1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam – ENDC Anchor B2)



Plot 7-110. Ant1-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
96546.35	Low	50	H	QPSK	V	189	270	-39.14	-13.00	-26.14
96456.35	Low	50	V	QPSK	V	13	352	-40.04	-13.00	-27.04
96470.10	Mid	50	H	QPSK	V	-	-	-39.95	-13.00	-26.95
96472.15	Mid	50	V	QPSK	V	31	80	-39.46	-13.00	-26.46
96491.40	High	50	H	QPSK	V	-	-	-40.01	-13.00	-27.01
96493.50	High	50	V	QPSK	V	-	-	-39.58	-13.00	-26.58

Table 7-61. Ant1 - SISO -Spurious Emissions Table (90GHz - 100GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-36.56	-13.00	-23.56
Mid	50	QPSK	-36.69	-13.00	-23.69
High	50	QPSK	-36.78	-13.00	-23.78

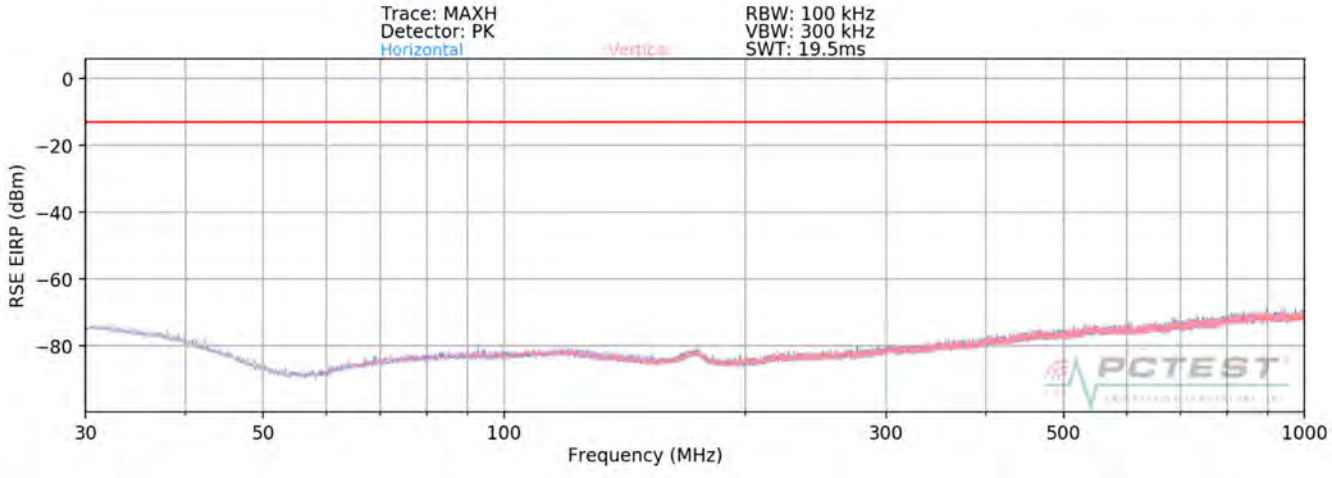
Table 7-62. Ant1 - MIMO -Spurious Emissions Table (90GHz - 100GHz)

Notes

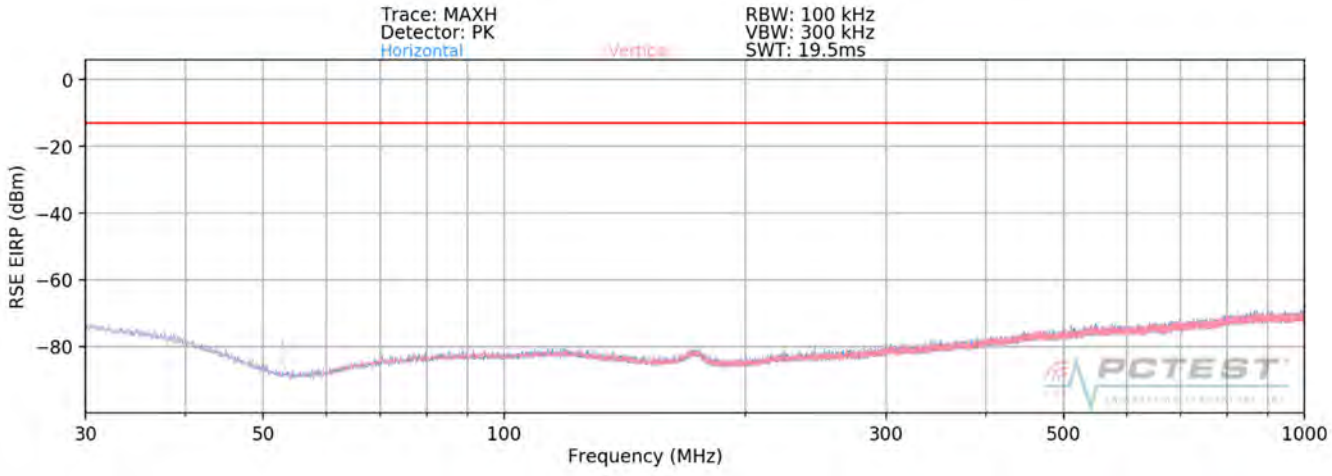
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

Band n261 – Ant2
30MHz - 1GHz

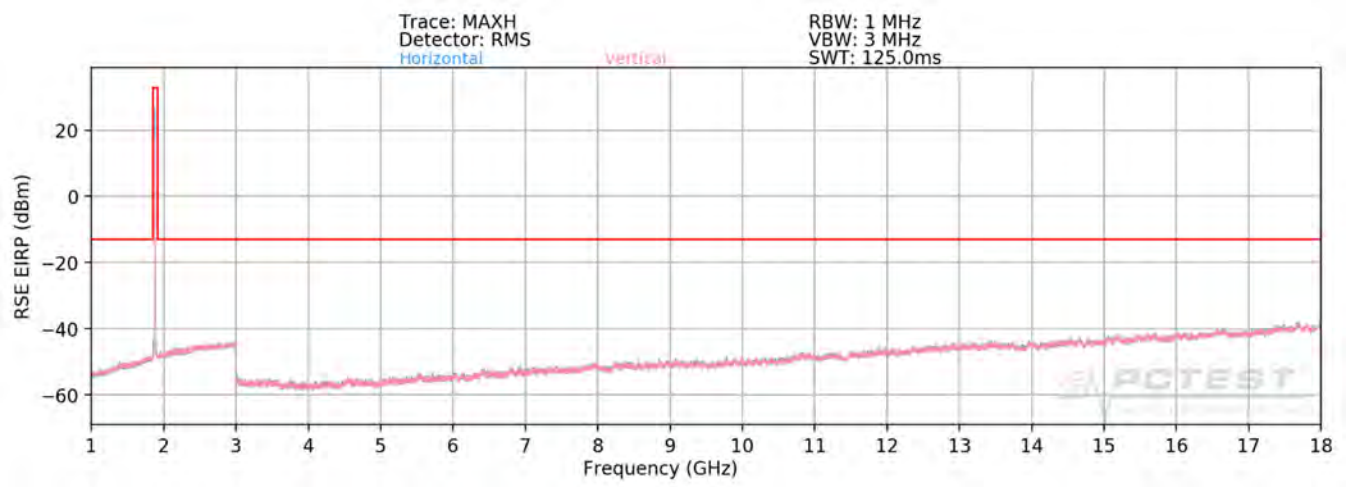


Plot 7-111. Ant2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam)

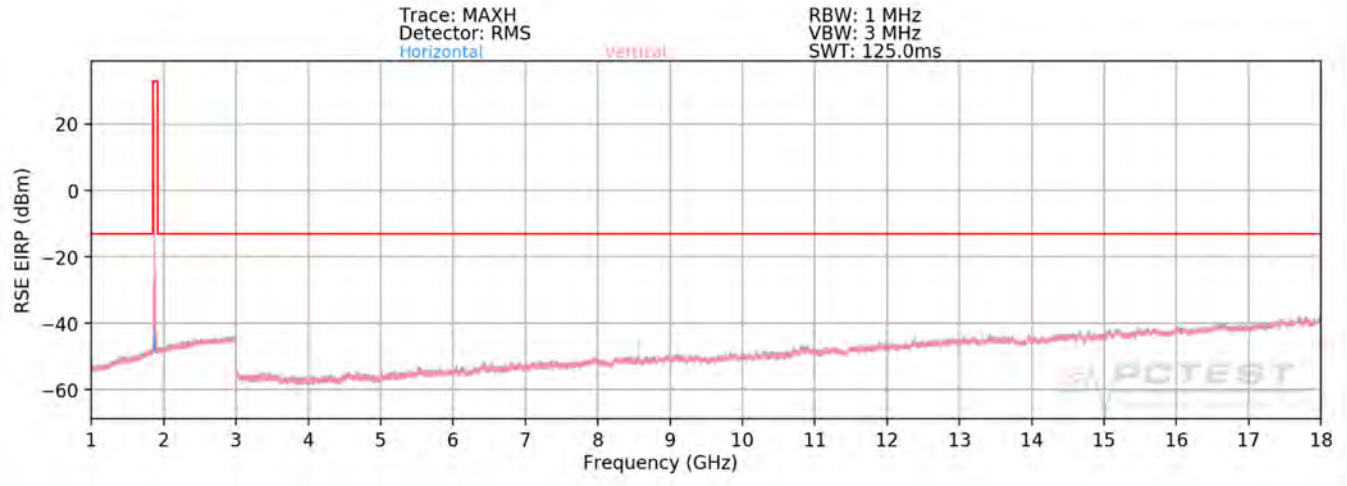


Plot 7-112. Ant2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam)

1GHz - 18GHz



Plot 7-113. Ant2-n261 Radiated Spurious Plot 1GHz - 18GHz (1CC QPSK Mid Channel H Beam – ENDC Anchor Band 2)



Plot 7-114. Ant2-n261 Radiated Spurious Plot 1GHz - 18GHz (1CC QPSK Mid Channel V Beam – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8821.85	Low	50	H	QPSK	V	142	346	-40.09	-13.00	-27.09
8821.85	Low	50	V	QPSK	H	286	10	-42.46	-13.00	-29.46
8569.16	Mid	50	H	QPSK	V	155	326	-42.89	-13.00	-29.89
8569.16	Mid	50	V	QPSK	H	284	21	-43.67	-13.00	-30.67
8966.56	High	50	H	QPSK	V	136	349	-38.28	-13.00	-25.28
8966.56	High	50	V	QPSK	H	290	10	-40.56	-13.00	-27.56

Table 7-63. Ant2 - SISO -Spurious Emissions Table (1GHz - 18GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-38.10	-13.00	-25.10
Mid	50	QPSK	-40.25	-13.00	-27.25
High	50	QPSK	-36.26	-13.00	-23.26

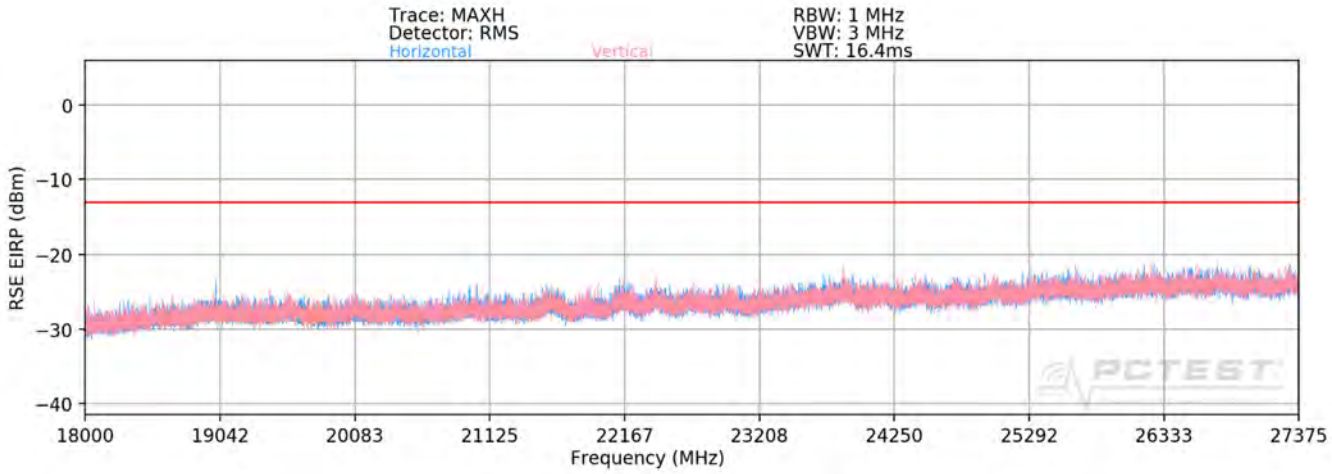
Table 7-64. Ant2 - MIMO -Spurious Emissions Table (1GHz - 18GHz)

Notes

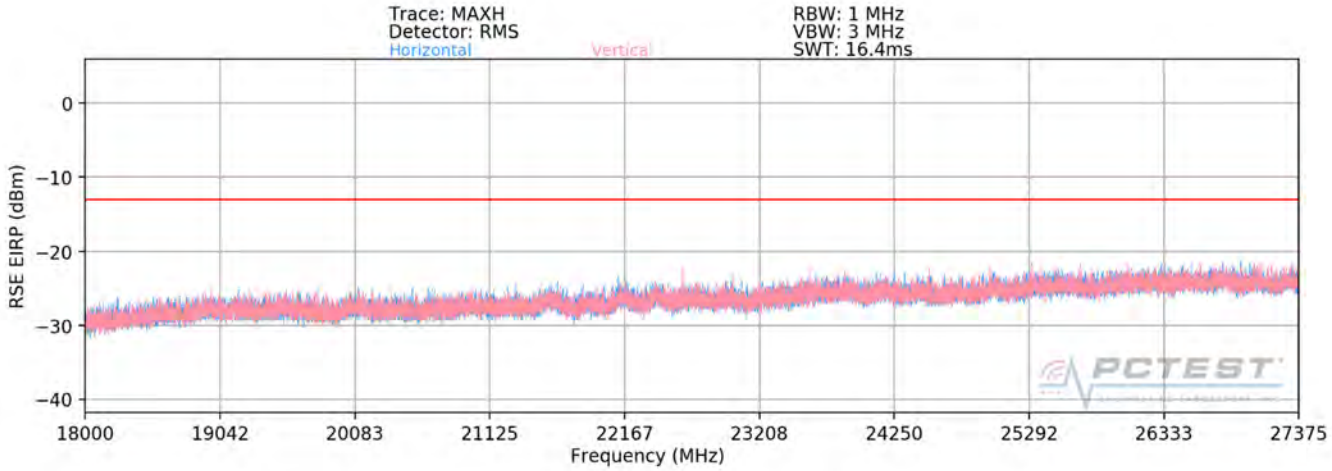
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

18GHz - 27.375GHz



Plot 7-115. Ant2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam – ENDC Anchor B2)



Plot 7-116. Ant2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
27228.14	Low	50	H	QPSK	H	121	47	-27.91	-13.00	-14.91
27381.83	Low	50	V	QPSK	V	57	120	-33.44	-13.00	-20.44
27307.66	Mid	50	H	QPSK	H	121	50	-35.61	-13.00	-22.61
27384.47	Mid	50	V	QPSK	V	57	119	-34.76	-13.00	-21.76
25571.95	High	50	H	QPSK	H	-	-	-36.34	-13.00	-23.34
25610.03	High	50	V	QPSK	V	-	-	-36.59	-13.00	-23.59

Table 7-65. Ant2 - SISO -Spurious Emissions Table (18GHz - 27.375GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-26.84	-13.00	-13.84
Mid	50	QPSK	-32.15	-13.00	-19.15
High	50	QPSK	-33.45	-13.00	-20.45

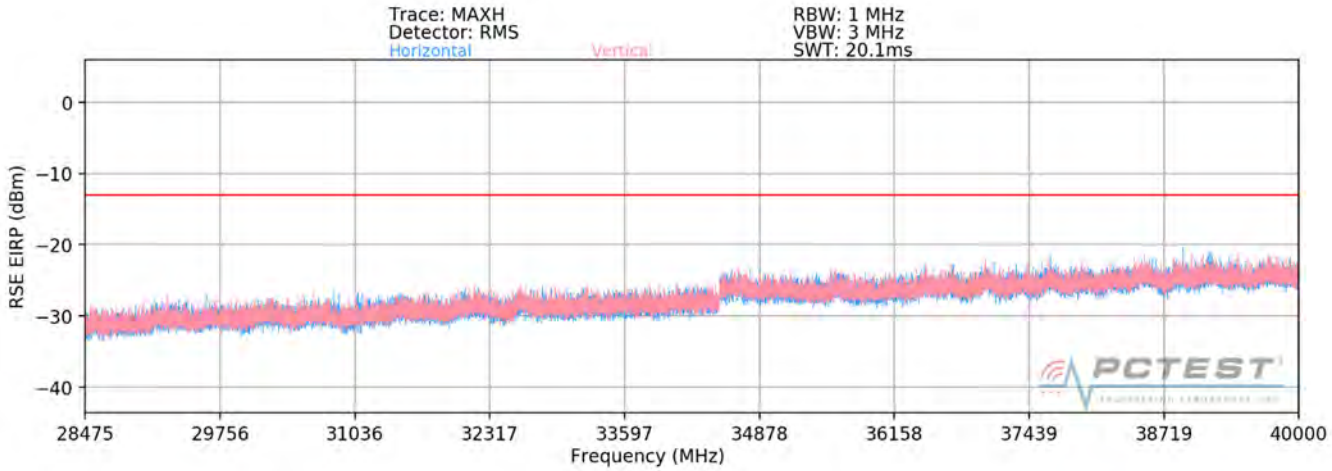
Table 7-66. Ant2 - MIMO -Spurious Emissions Table (18GHz - 27.375GHz)

Notes

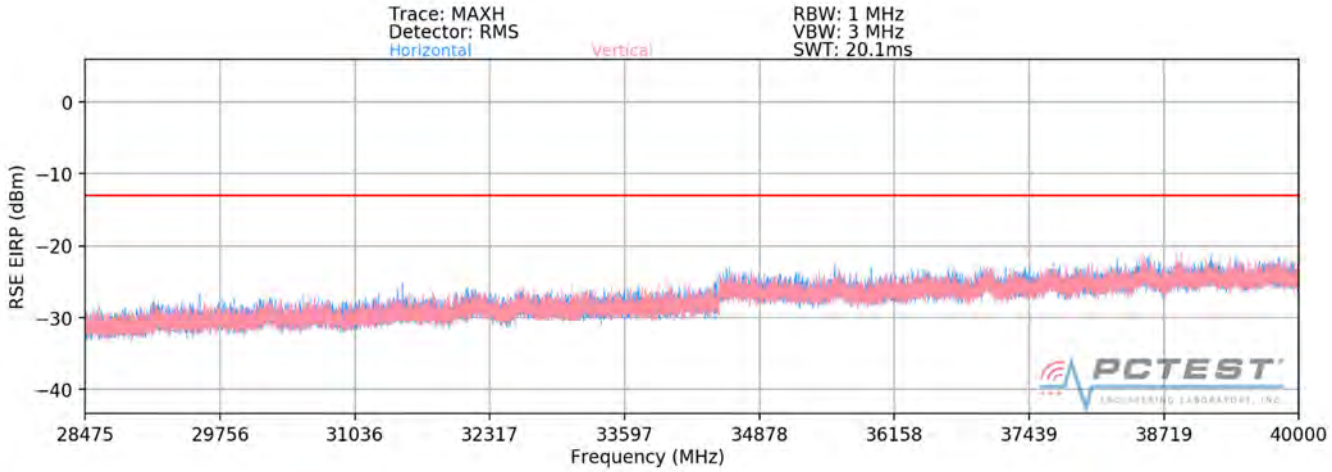
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

28.475GHz - 40GHz



Plot 7-117. Ant2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam – ENDC Anchor B2)



Plot 7-118. Ant2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
28604.99	Low	50	H	QPSK	H	116	32	-33.20	-13.00	-20.20
28605.11	Low	50	V	QPSK	V	45	118	-32.78	-13.00	-19.78
30138.22	Mid	50	H	QPSK	H	120	26	-32.13	-13.00	-19.13
30138.10	Mid	50	V	QPSK	V	55	117	-34.14	-13.00	-21.14
28627.22	High	50	H	QPSK	H	123	37	-29.63	-13.00	-16.63
29740.27	High	50	V	QPSK	V	52	117	-33.09	-13.00	-20.09

Table 7-67. Ant2 - SISO -Spurious Emissions Table (28.475GHz - 40GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-29.98	-13.00	-16.98
Mid	50	QPSK	-30.01	-13.00	-17.01
High	50	QPSK	-28.01	-13.00	-15.01

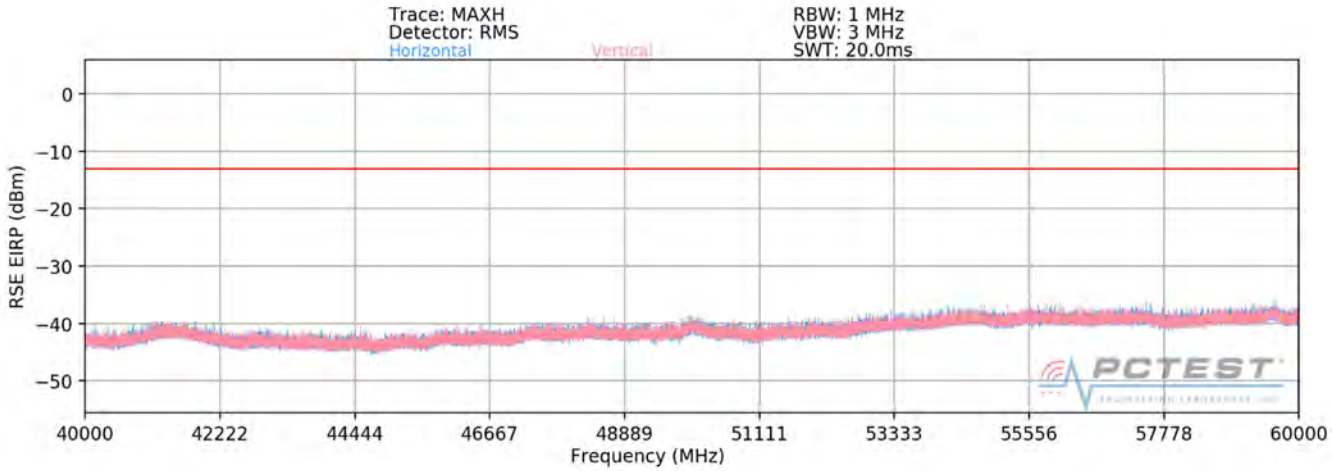
Table 7-68. Ant2 - MIMO -Spurious Emissions Table (28.475GHz - 40GHz)

Notes

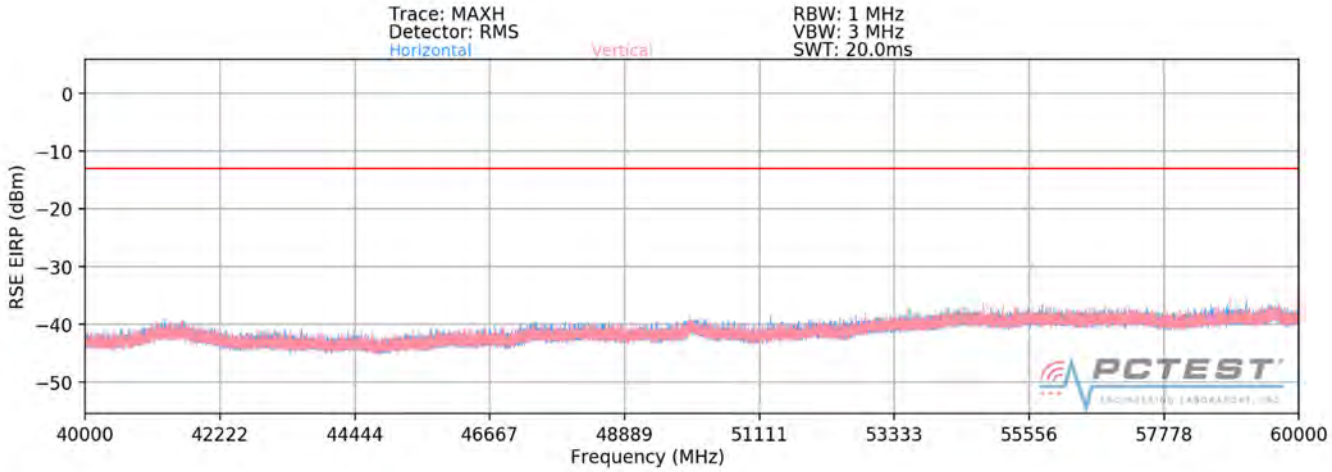
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

40GHz - 60GHz



Plot 7-119. Ant2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam – ENDC Anchor B2)



Plot 7-120. Ant2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1.5 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
55070.68	Low	50	H	QPSK	H	48	337	-52.74	-13.00	-39.74
55070.78	Low	50	V	QPSK	H	228	24	-54.60	-13.00	-41.60
55845.06	Mid	50	H	QPSK	H	166	267	-46.86	-13.00	-33.86
55845.46	Mid	50	V	QPSK	H	235	58	-52.20	-13.00	-39.20
56640.33	High	50	H	QPSK	H	288	169	-46.88	-13.00	-33.88
56640.51	High	50	V	QPSK	H	31	345	-54.83	-13.00	-41.83

Table 7-69. Ant2 - SISO -Spurious Emissions Table (40GHz - 60GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-50.56	-13.00	-37.56
Mid	50	QPSK	-45.74	-13.00	-32.74
High	50	QPSK	-46.23	-13.00	-33.23

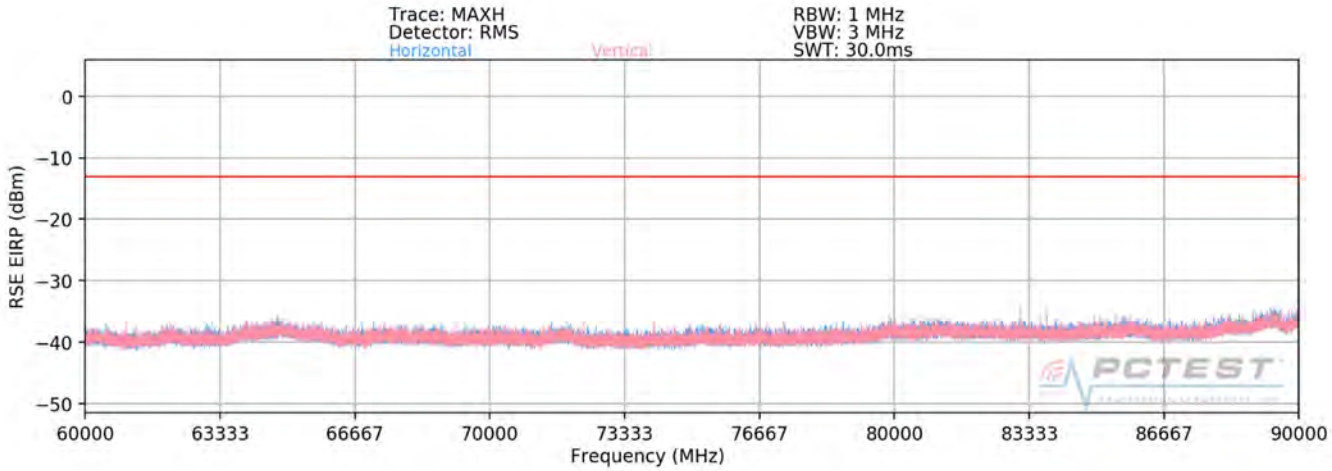
Table 7-70. Ant2 - MIMO -Spurious Emissions Table (40GHz - 60GHz)

Notes

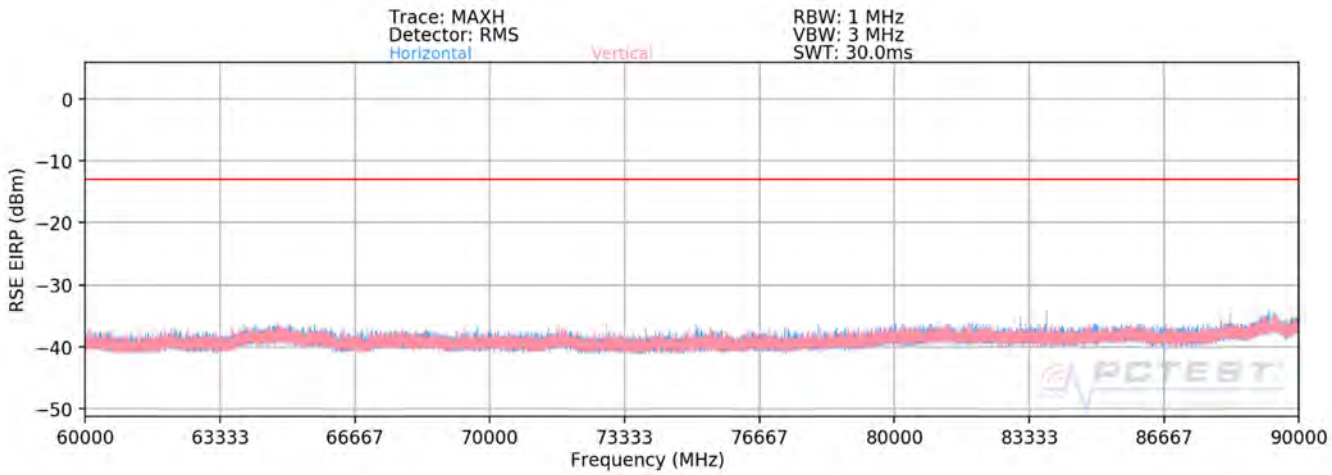
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

60GHz - 90GHz



Plot 7-121. Ant2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam – ENDC Anchor B2)



Plot 7-122. Ant2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
82601.45	Low	50	H	QPSK	H	290	110	-46.54	-13.00	-33.54
82606.48	Low	50	V	QPSK	V	207	35	-46.55	-13.00	-33.55
83768.15	Mid	50	H	QPSK	H	221	80	-47.31	-13.00	-34.31
83768.94	Mid	50	V	QPSK	V	215	70	-46.75	-13.00	-33.75
84962.51	High	50	H	QPSK	H	300	17	-46.43	-13.00	-33.43
84961.47	High	50	V	QPSK	V	140	255	-51.30	-13.00	-38.30

Table 7-71. Ant2 - SISO -Spurious Emissions Table (60GHz - 90GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-43.54	-13.00	-30.54
Mid	50	QPSK	-44.01	-13.00	-31.01
High	50	QPSK	-45.20	-13.00	-32.20

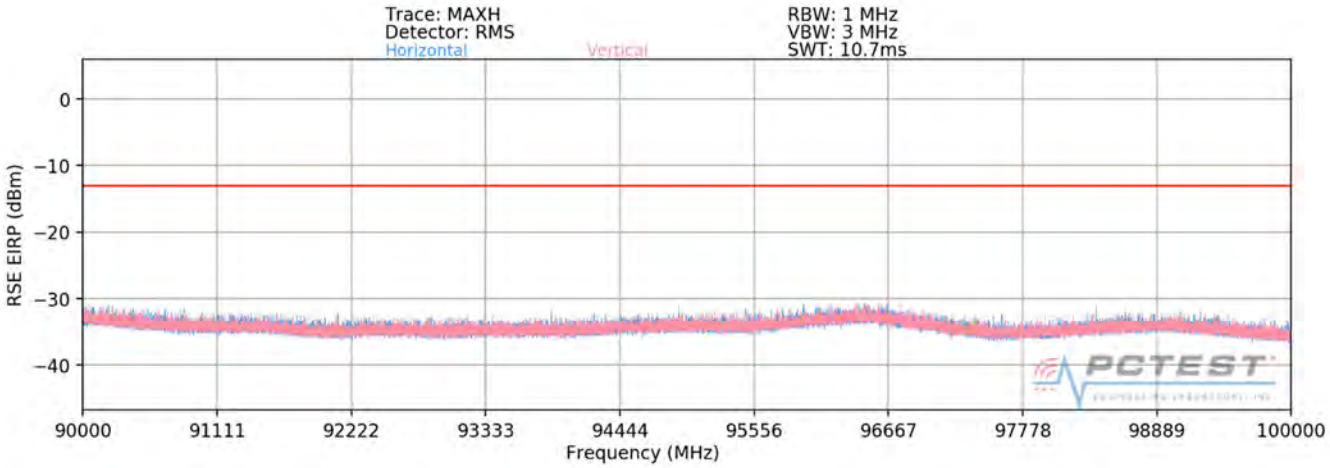
Table 7-72. Ant2 - MIMO -Spurious Emissions Table (60GHz - 90GHz)

Notes

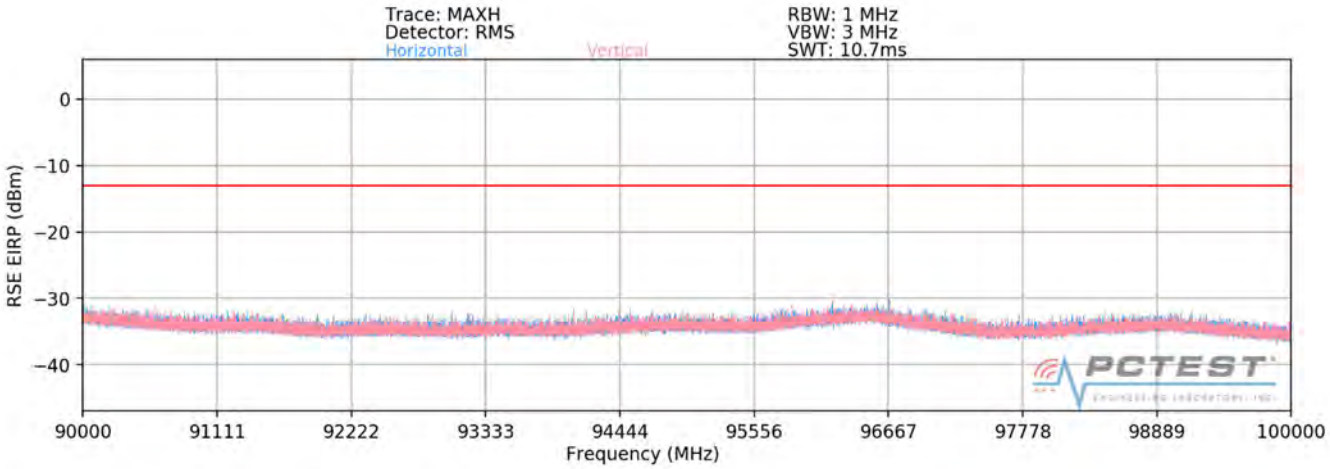
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

90GHz - 100GHz



Plot 7-123. Ant2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam – ENDC Anchor B2)



Plot 7-124. Ant2-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8 + Harmonic Mixer Conversion Loss [dB]

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
96476.10	Low	50	H	QPSK	V	-	-	-40.01	-13.00	-27.01
96476.12	Low	50	V	QPSK	V	-	-	-41.12	-13.00	-28.12
96470.85	Mid	50	H	QPSK	V	-	-	-39.59	-13.00	-26.59
96464.15	Mid	50	V	QPSK	V	-	-	-40.14	-13.00	-27.14
96471.11	High	50	H	QPSK	V	-	-	-39.49	-13.00	-26.49
96473.65	High	50	V	QPSK	V	-	-	-39.93	-13.00	-26.93

Table 7-73. Ant2 - SISO -Spurious Emissions Table (90GHz - 100GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-37.52	-13.00	-24.52
Mid	50	QPSK	-36.84	-13.00	-23.84
High	50	QPSK	-36.69	-13.00	-23.69

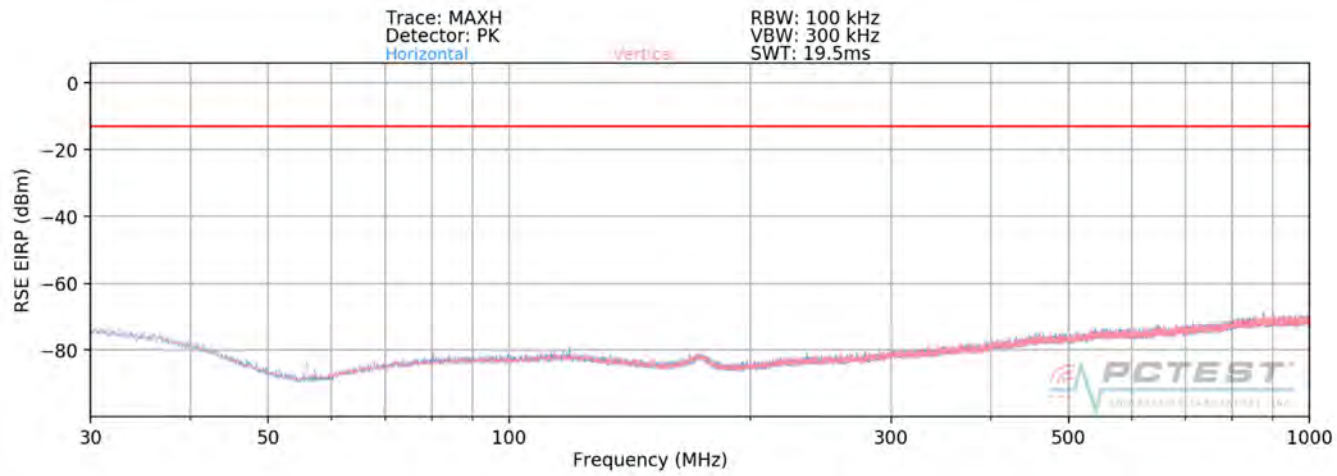
Table 7-74. Ant2 - MIMO -Spurious Emissions Table (90GHz - 100GHz)

Notes

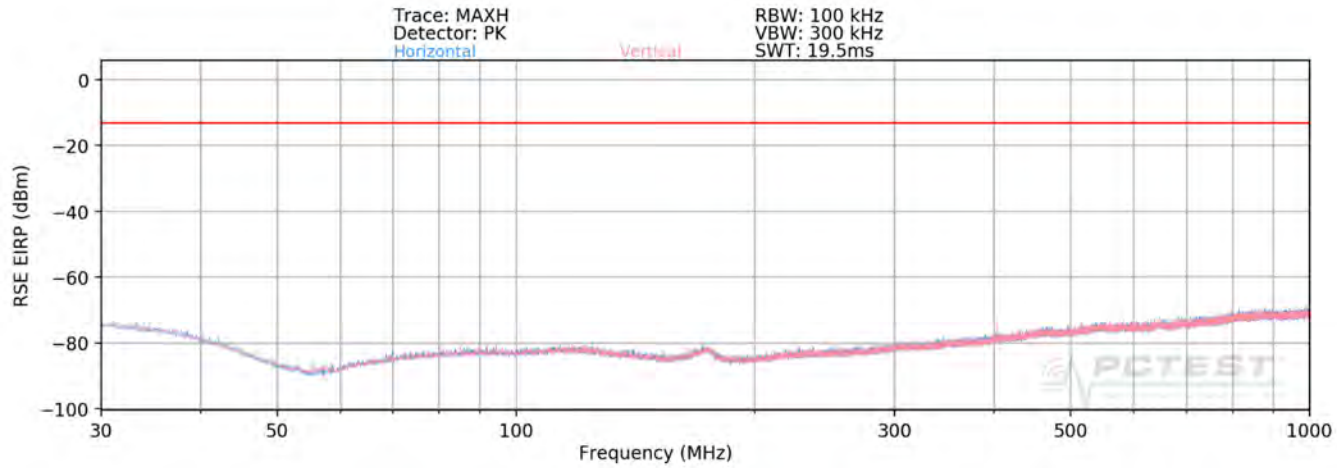
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

Band n261 – Ant3
30MHz - 1GHz

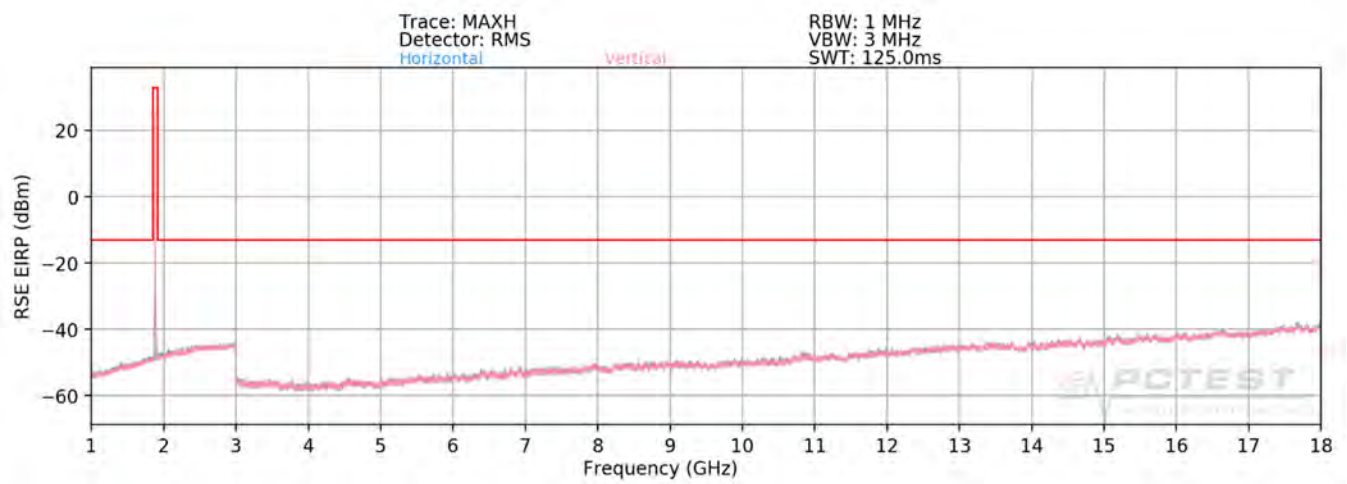


Plot 7-125. Ant3-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam)

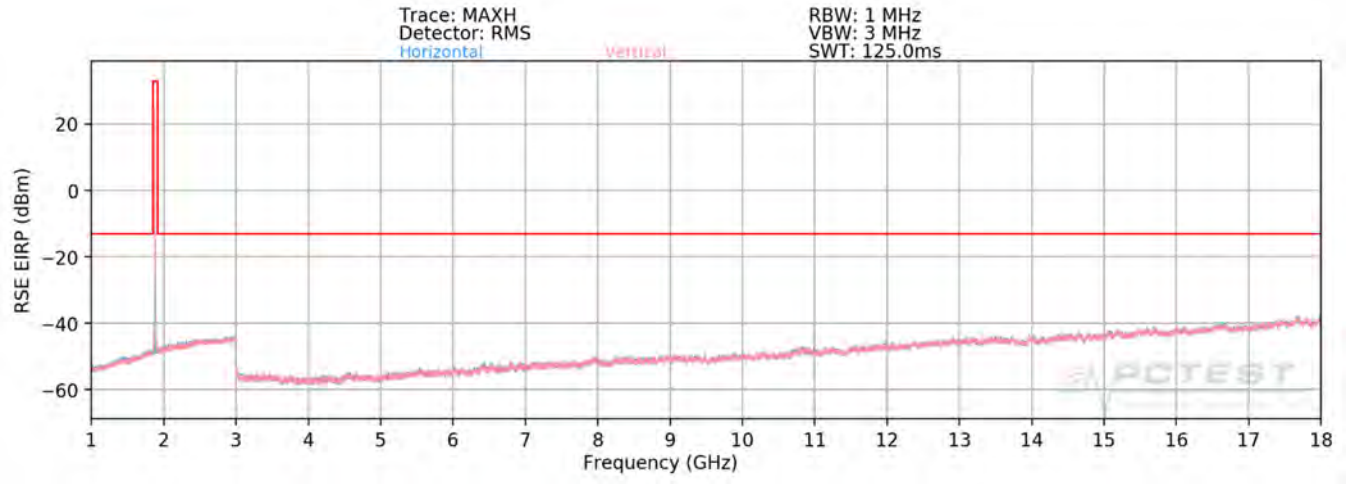


Plot 7-126. Ant3-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam)

1GHz - 18GHz



Plot 7-127. Ant3-n261 Radiated Spurious Plot 1GHz - 18GHz (1CC QPSK Mid Channel H Beam – ENDC Anchor Band 2)



Plot 7-128. Ant3-n261 Radiated Spurious Plot 1GHz - 18GHz (1CC QPSK Mid Channel V Beam - – ENDC Anchor Band 2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Antenna Height [cm]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
8821.85	Low	50	H	QPSK	V	101	28	-46.63	-13.00	-33.63
8821.85	Low	50	V	QPSK	V	102	351	-43.82	-13.00	-30.82
8569.16	Mid	50	H	QPSK	V	112	15	-48.46	-13.00	-35.46
8569.16	Mid	50	V	QPSK	V	100	4	-45.24	-13.00	-32.24
8966.56	High	50	H	QPSK	V	102	25	-45.11	-13.00	-32.11
8966.56	High	50	V	QPSK	V	100	354	-44.25	-13.00	-31.25

Table 7-75. Ant3 - SISO -Spurious Emissions Table (1GHz - 18GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-41.99	-13.00	-28.99
Mid	50	QPSK	-43.55	-13.00	-30.55
High	50	QPSK	-41.65	-13.00	-28.65

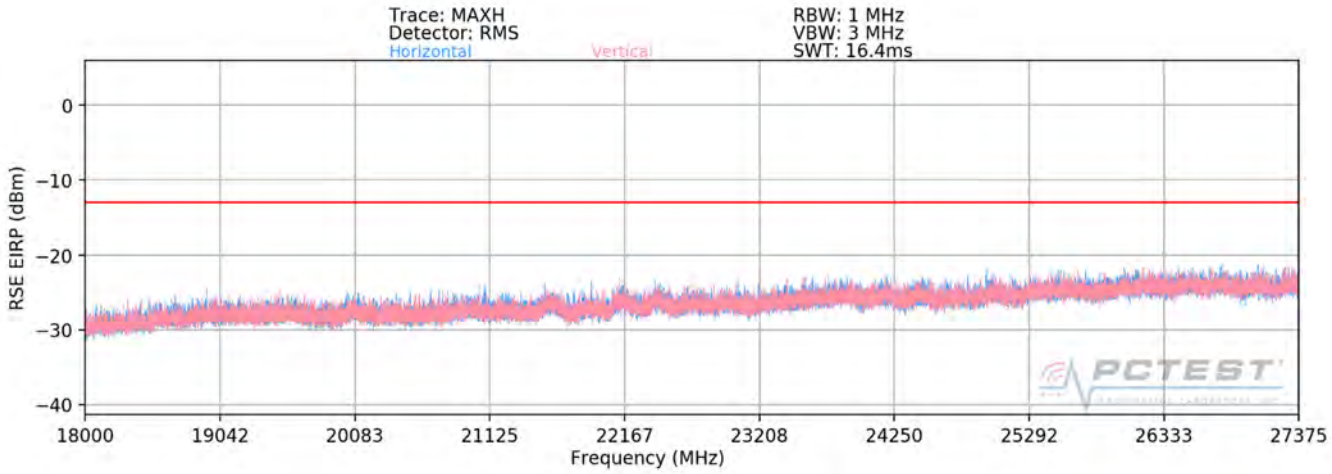
Table 7-76. Ant3 - MIMO -Spurious Emissions Table (1GHz - 18GHz)

Notes

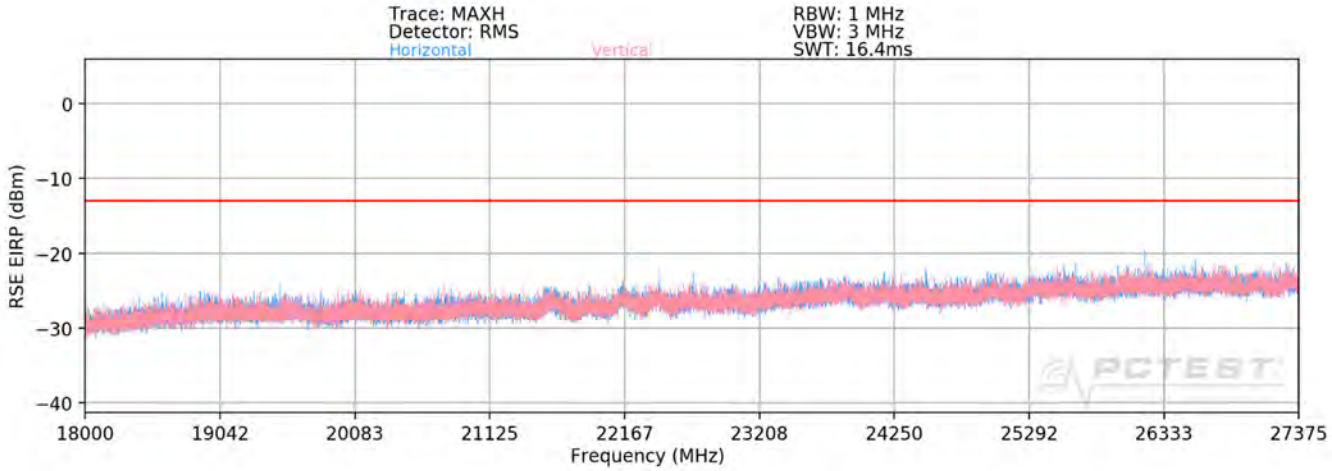
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

18GHz - 27.375GHz



Plot 7-129. Ant3-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam – ENDC Anchor B2)



Plot 7-130. Ant3-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
27228.21	Low	50	H	QPSK	H	75	52	-26.02	-13.00	-13.02
27381.17	Low	50	V	QPSK	H	178	138	-30.74	-13.00	-17.74
27384.94	Mid	50	H	QPSK	H	72	42	-35.11	-13.00	-22.11
27385.04	Mid	50	V	QPSK	H	174	135	-33.61	-13.00	-20.61
27398.61	High	50	H	QPSK	H	75	51	-34.81	-13.00	-21.81
26199.75	High	50	V	QPSK	H	-	-	-35.75	-13.00	-22.75

Table 7-77. Ant3 - SISO -Spurious Emissions Table (18GHz - 27.375GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-24.76	-13.00	-11.76
Mid	50	QPSK	-31.29	-13.00	-18.29
High	50	QPSK	-32.24	-13.00	-19.24

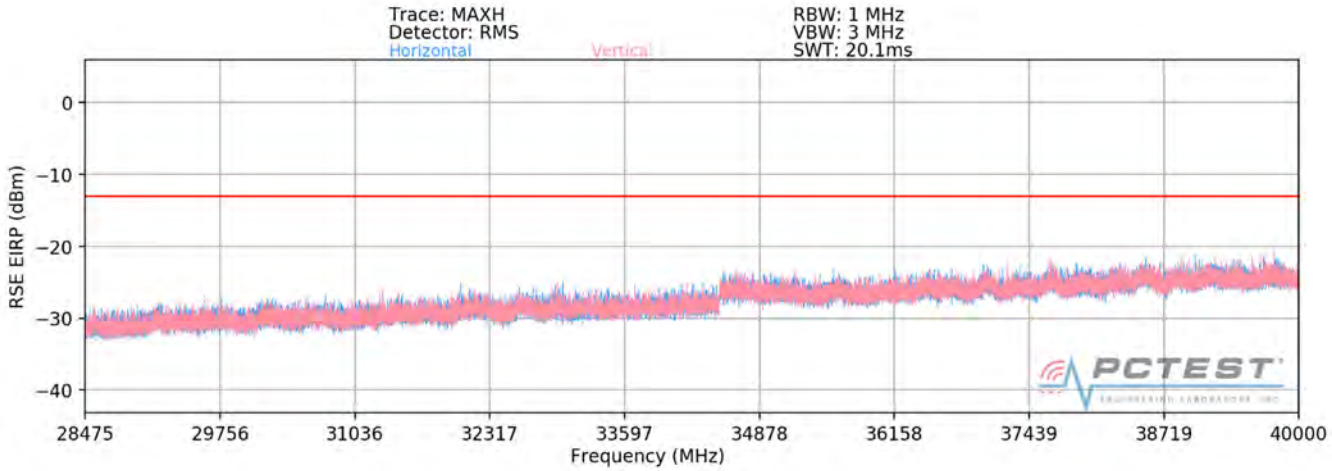
Table 7-78. Ant3 - MIMO -Spurious Emissions Table (18GHz - 27.375GHz)

Notes

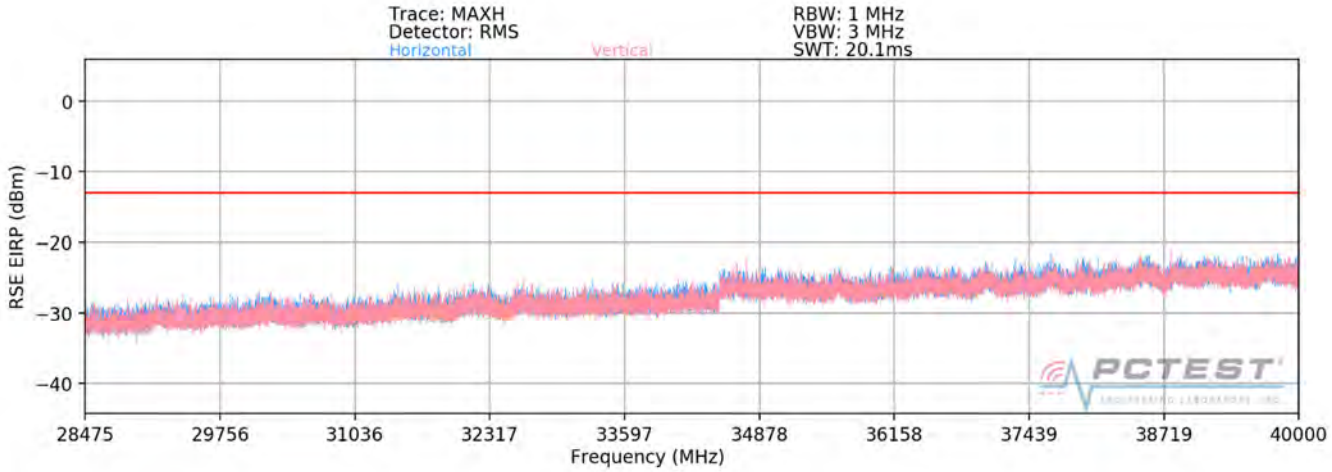
1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)

28.475GHz - 40GHz



Plot 7-131. Ant3-n261 Radiated Spurious Plot (1CC QPSK Mid Channel H Beam – ENDC Anchor B2)



Plot 7-132. Ant3-n261 Radiated Spurious Plot (1CC QPSK Mid Channel V Beam – ENDC Anchor B2)

Spurious Emissions EIRP Sample Calculation (n261)

The raw radiated spurious level is converted to field strength in dBuV/m. Then, the RSE EIRP level is calculated by applying the additional factors shown below for a test distance of 1 meter.

RSE EIRP (dBm) = Analyzer Level (dBm) + 107 + AFCL (dB/m) + 20Log(Dm) – 104.8

Frequency [MHz]	Channnel	Bandwidth (MHz)	EUT Beam Pol.	Modulation	Antenna Polarization [H/V]	Turntable Azimuth [degrees]	Positioner Azimuth [degrees]	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
28605.11	Low	50	H	QPSK	H	83	49	-25.28	-13.00	-12.28
28605.34	Low	50	V	QPSK	H	196	141	-23.55	-13.00	-10.55
30137.87	Mid	50	H	QPSK	H	75	52	-29.57	-13.00	-16.57
30137.87	Mid	50	V	QPSK	H	192	128	-28.73	-13.00	-15.73
29740.61	High	50	H	QPSK	H	79	46	-27.50	-13.00	-14.50
29740.61	High	50	V	QPSK	H	190	133	-26.32	-13.00	-13.32

Table 7-79. Ant3 - SISO -Spurious Emissions Table (28.475GHz - 40GHz)

Channnel	Bandwidth (MHz)	Modulation	Spurious Emission Level [dBm]	Limit [dBm]	Margin [dB]
Low	50	QPSK	-21.32	-13.00	-8.32
Mid	50	QPSK	-26.12	-13.00	-13.12
High	50	QPSK	-23.86	-13.00	-10.86

Table 7-80. Ant3 - MIMO -Spurious Emissions Table (28.475GHz - 40GHz)

Notes

1. The RSE EIRP level is taken directly from the spectrum analyzer which includes the appropriate antenna factors, cable losses, and harmonic mixer conversion losses. Measurements were performed at a distance of 1 meter.
2. To address compliance of MIMO RSE per KDB 662911 D01, the MIMO RSE EIRP is calculated by summing the worst case H Beam EIRP and V Beam EIRP in linear powers units then converted back to dBm:

EIRP(H Beam) + EIRP(V Beam) = EIRP(MIMO)