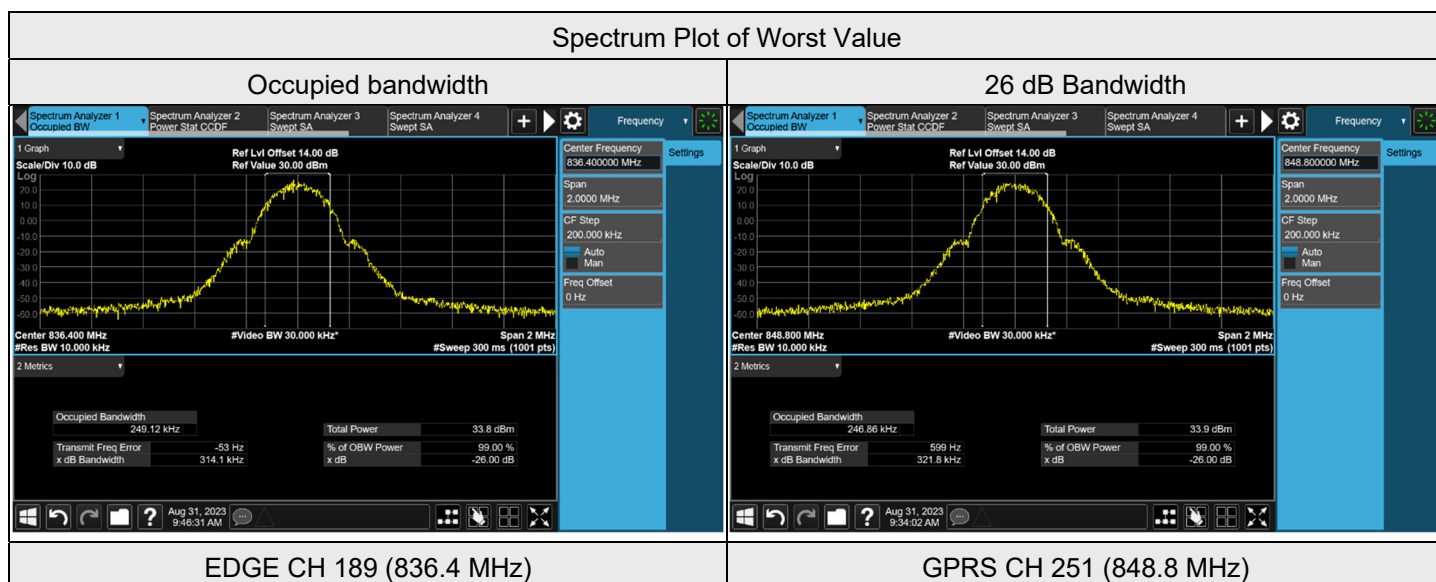


## 7.4 Bandwidth

Input Power:	4.7 Vdc	Environmental Conditions:	22°C, 73% RH	Tested By:	Willy Cheng
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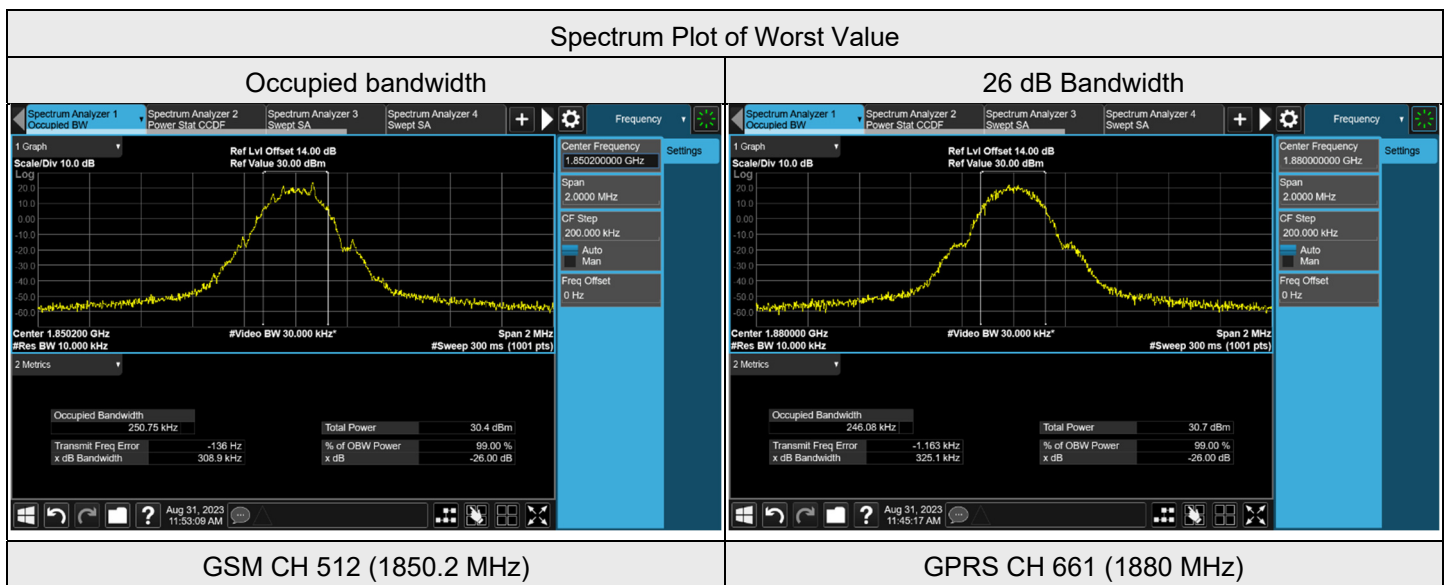
### 7.4.1 GSM 850

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
GSM	128	824.2	242.56	308.20
GSM	189	836.4	242.53	304.00
GSM	251	848.8	242.30	310.70
GPRS	128	824.2	244.21	311.30
GPRS	189	836.4	247.07	313.10
GPRS	251	848.8	246.86	321.80
EDGE	128	824.2	246.59	314.90
EDGE	189	836.4	249.12	314.10
EDGE	251	848.8	246.64	306.10



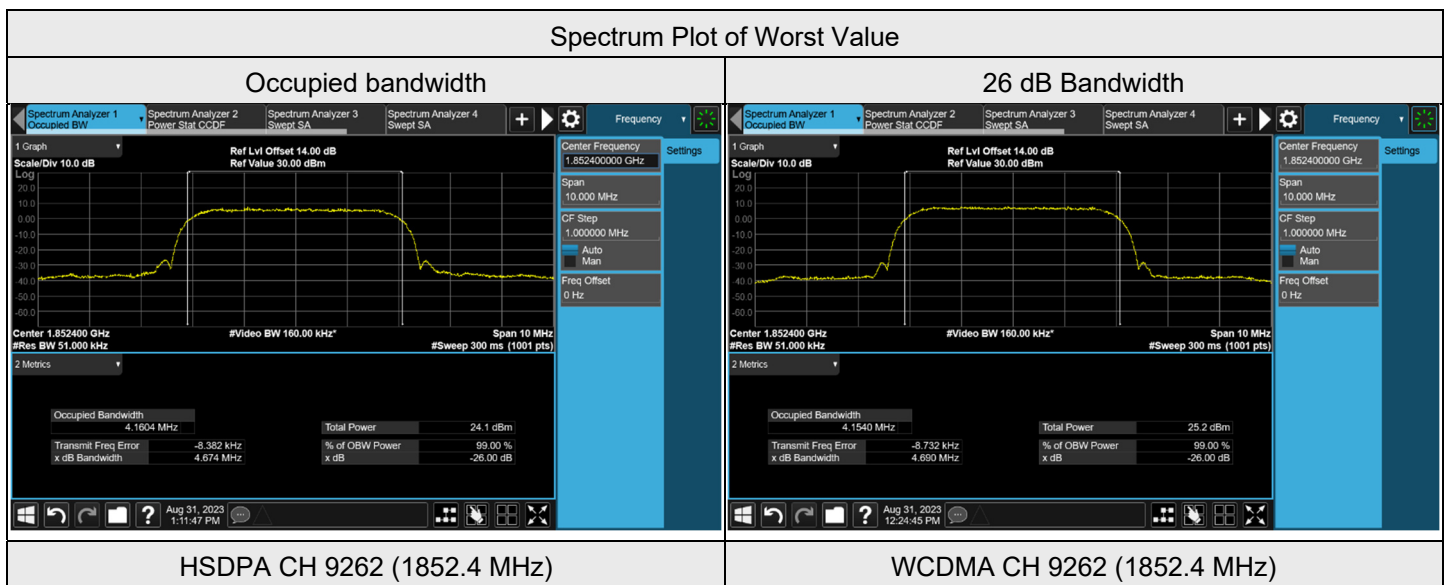
7.4.2 GSM 1900

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (kHz)	26 dB Bandwidth (kHz)
GSM	512	1850.2	250.75	308.90
GSM	661	1880	244.47	305.80
GSM	810	1909.8	240.38	305.50
GPRS	512	1850.2	246.05	312.50
GPRS	661	1880	246.08	325.10
GPRS	810	1909.8	243.19	318.50
EDGE	512	1850.2	244.62	315.10
EDGE	661	1880	247.89	316.30
EDGE	810	1909.8	247.97	317.80



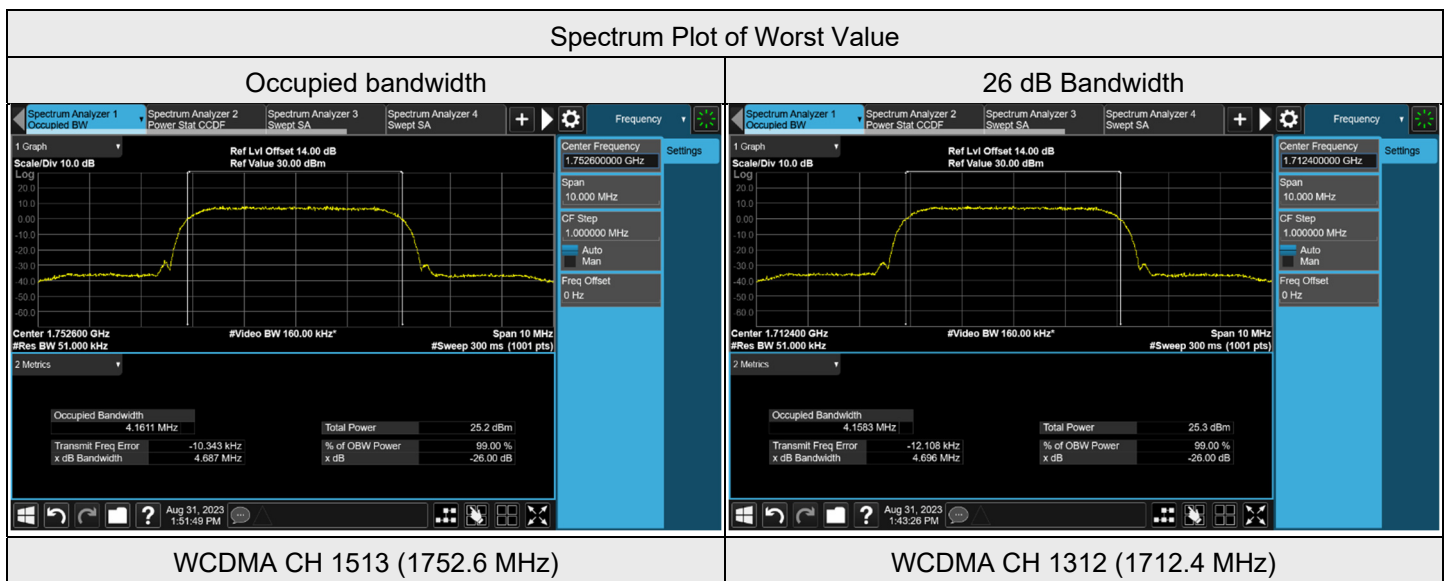
### 7.4.3 WCDMA Band 2

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
WCDMA	9262	1852.4	4.1540	4.690
WCDMA	9400	1880	4.1505	4.683
WCDMA	9538	1907.6	4.1503	4.688
HSDPA	9262	1852.4	4.1604	4.674
HSDPA	9400	1880	4.1504	4.663
HSDPA	9538	1907.6	4.1565	4.665
HSUPA	9262	1852.4	4.1526	4.659
HSUPA	9400	1880	4.1597	4.673
HSUPA	9538	1907.6	4.1539	4.664



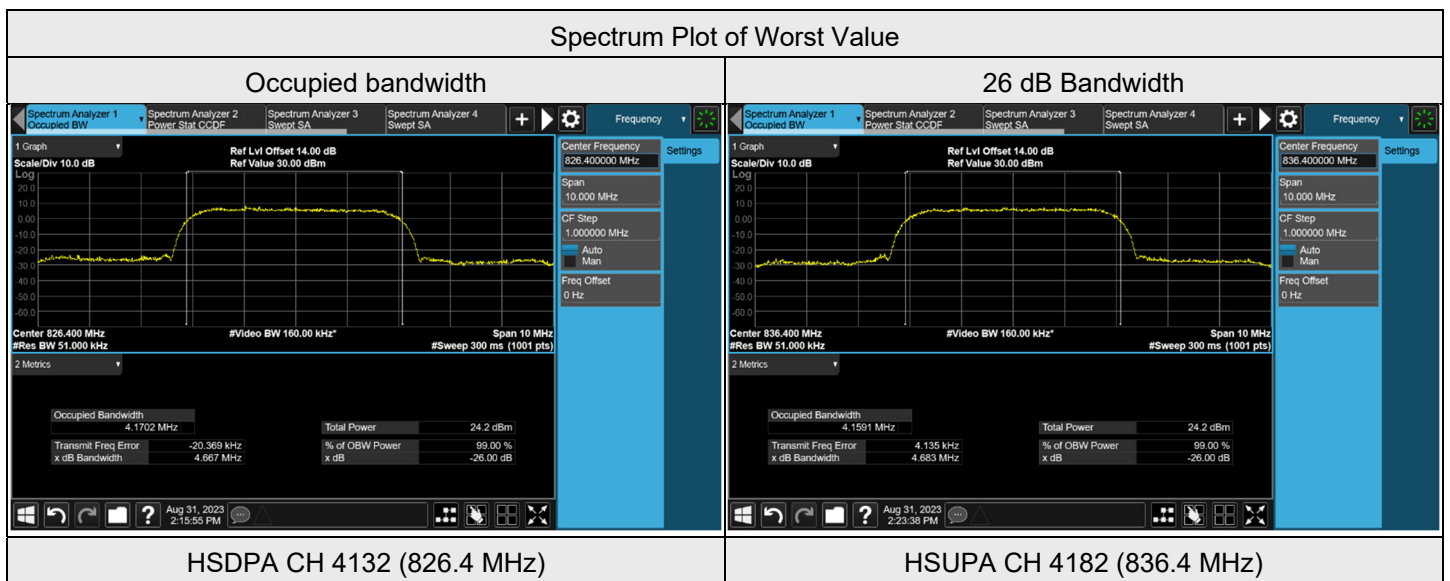
7.4.4 WCDMA Band 4

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
WCDMA	1312	1712.4	4.1583	4.696
WCDMA	1413	1732.6	4.1523	4.695
WCDMA	1513	1752.6	4.1611	4.687
HSDPA	1312	1712.4	4.1547	4.678
HSDPA	1413	1732.6	4.1583	4.676
HSDPA	1513	1752.6	4.1503	4.677
HSUPA	1312	1712.4	4.1567	4.681
HSUPA	1413	1732.6	4.1572	4.683
HSUPA	1513	1752.6	4.1588	4.681



7.4.5 WCDMA Band 5

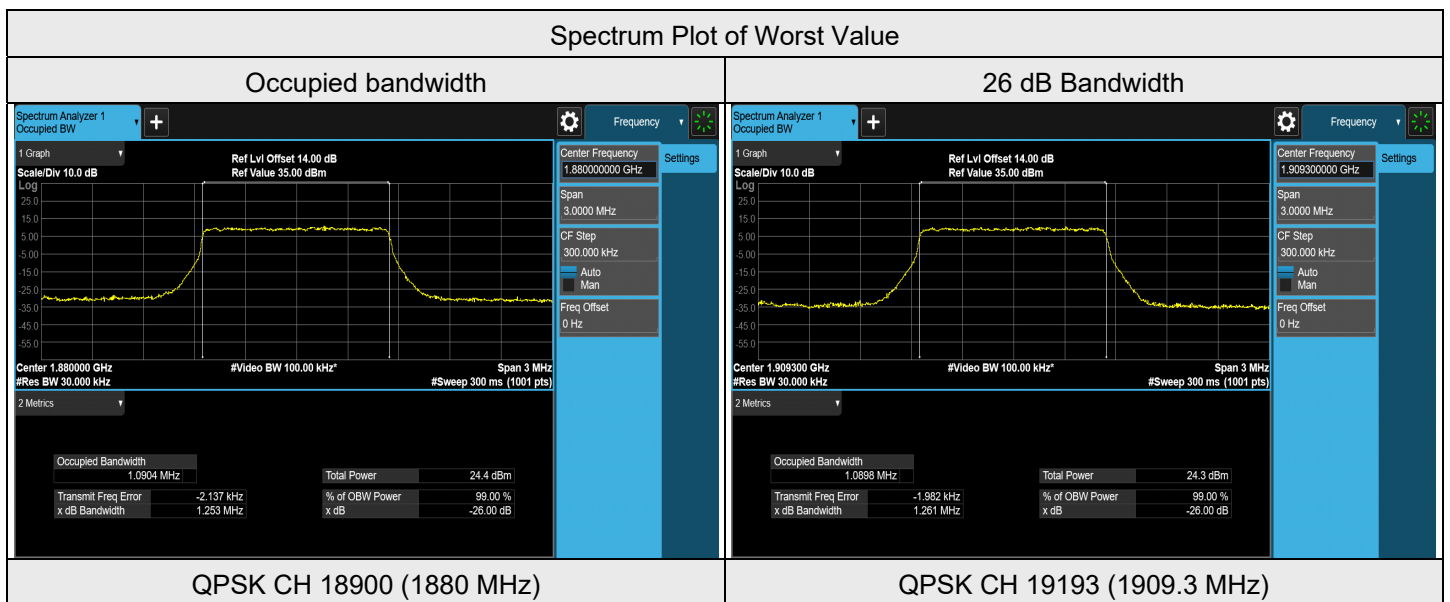
Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
WCDMA	4132	826.4	4.1648	4.658
WCDMA	4182	836.4	4.1615	4.666
WCDMA	4223	846.6	4.1550	4.654
HSDPA	4132	826.4	4.1702	4.667
HSDPA	4182	836.4	4.1644	4.675
HSDPA	4223	846.6	4.1629	4.672
HSUPA	4132	826.4	4.1697	4.675
HSUPA	4182	836.4	4.1591	4.683
HSUPA	4223	846.6	4.1655	4.672



7.4.6 LTE Band 2

LTE Band 2, Channel Bandwidth: 1.4 MHz

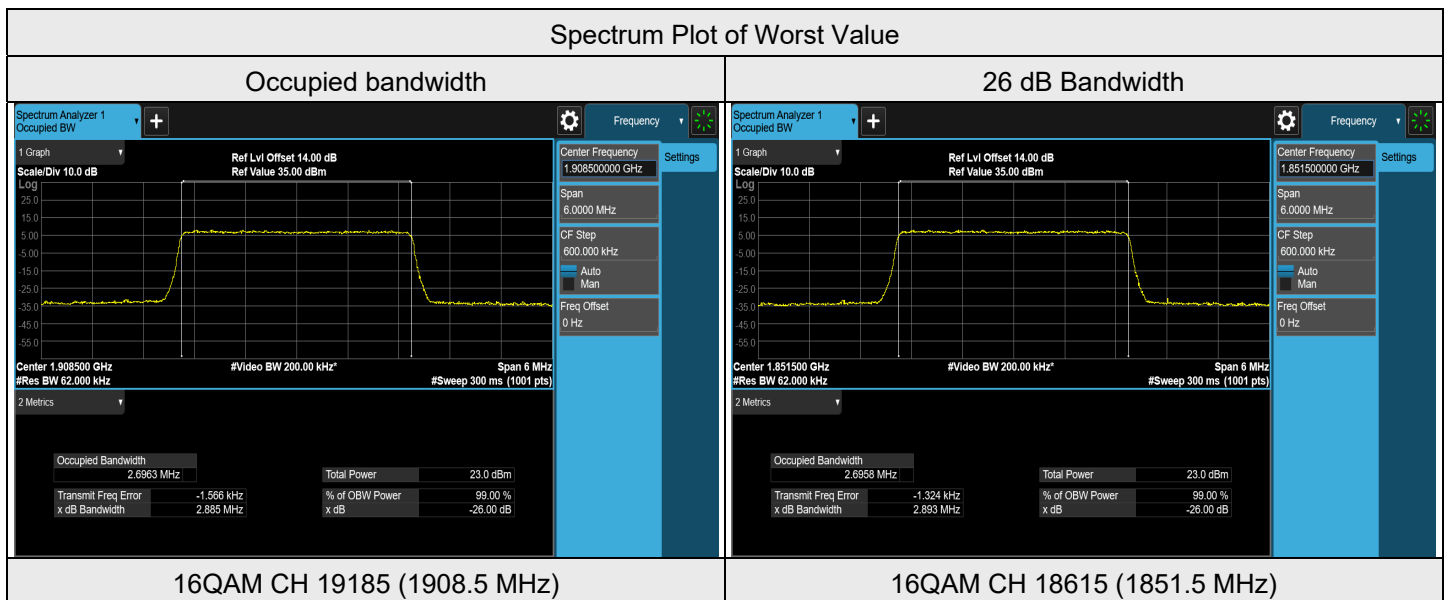
Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	18607	1850.7	1.0848	1.248
QPSK	18900	1880	1.0904	1.253
QPSK	19193	1909.3	1.0898	1.261
16QAM	18607	1850.7	1.0874	1.243
16QAM	18900	1880	1.0877	1.246
16QAM	19193	1909.3	1.0884	1.253
64QAM	18607	1850.7	1.0891	1.255
64QAM	18900	1880	1.0894	1.251
64QAM	19193	1909.3	1.0897	1.252
256QAM	18607	1850.7	1.0840	1.241
256QAM	18900	1880	1.0848	1.240
256QAM	19193	1909.3	1.0843	1.231





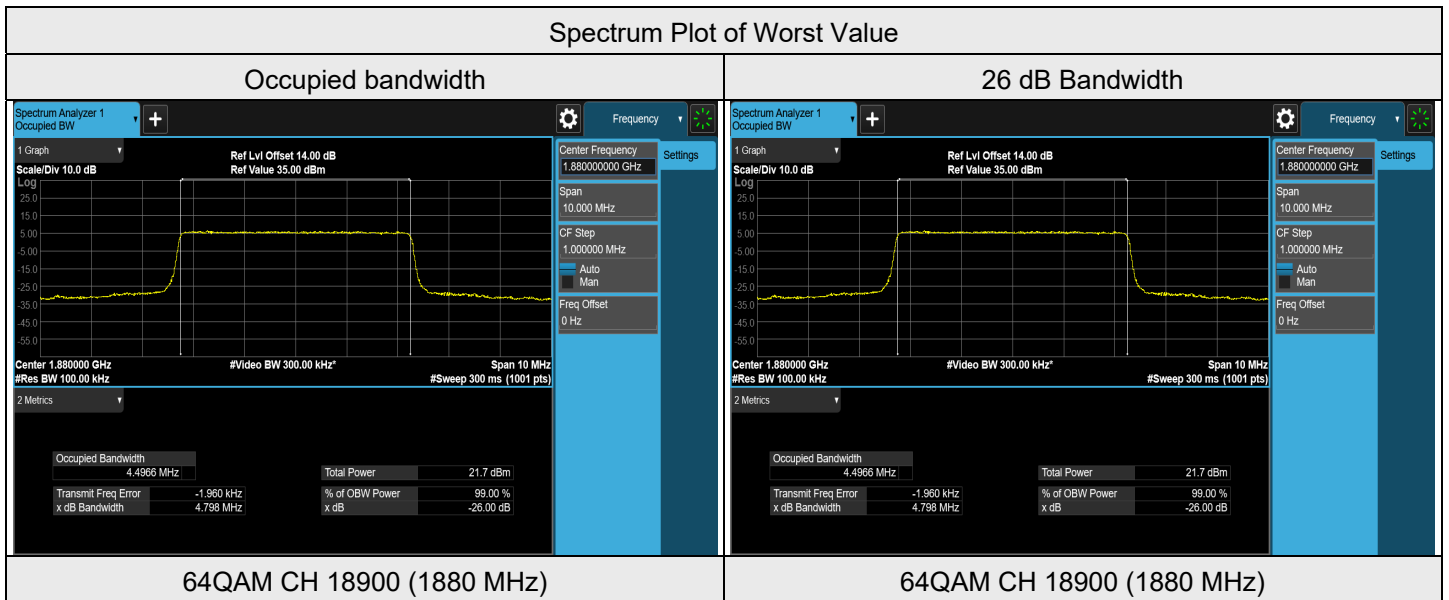
LTE Band 2, Channel Bandwidth: 3 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	18615	1851.5	2.6949	2.881
QPSK	18900	1880	2.6961	2.878
QPSK	19185	1908.5	2.6945	2.881
16QAM	18615	1851.5	2.6958	2.893
16QAM	18900	1880	2.6960	2.887
16QAM	19185	1908.5	2.6963	2.885
64QAM	18615	1851.5	2.6941	2.870
64QAM	18900	1880	2.6926	2.873
64QAM	19185	1908.5	2.6946	2.873
256QAM	18615	1851.5	2.6947	2.881
256QAM	18900	1880	2.6955	2.883
256QAM	19185	1908.5	2.6953	2.885



LTE Band 2, Channel Bandwidth: 5 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	18625	1852.5	4.4948	4.785
QPSK	18900	1880	4.4954	4.782
QPSK	19175	1907.5	4.4929	4.786
16QAM	18625	1852.5	4.4895	4.778
16QAM	18900	1880	4.4897	4.784
16QAM	19175	1907.5	4.4910	4.776
64QAM	18625	1852.5	4.4935	4.792
64QAM	18900	1880	4.4966	4.798
64QAM	19175	1907.5	4.4930	4.795
256QAM	18625	1852.5	4.4892	4.792
256QAM	18900	1880	4.4906	4.796
256QAM	19175	1907.5	4.4874	4.796

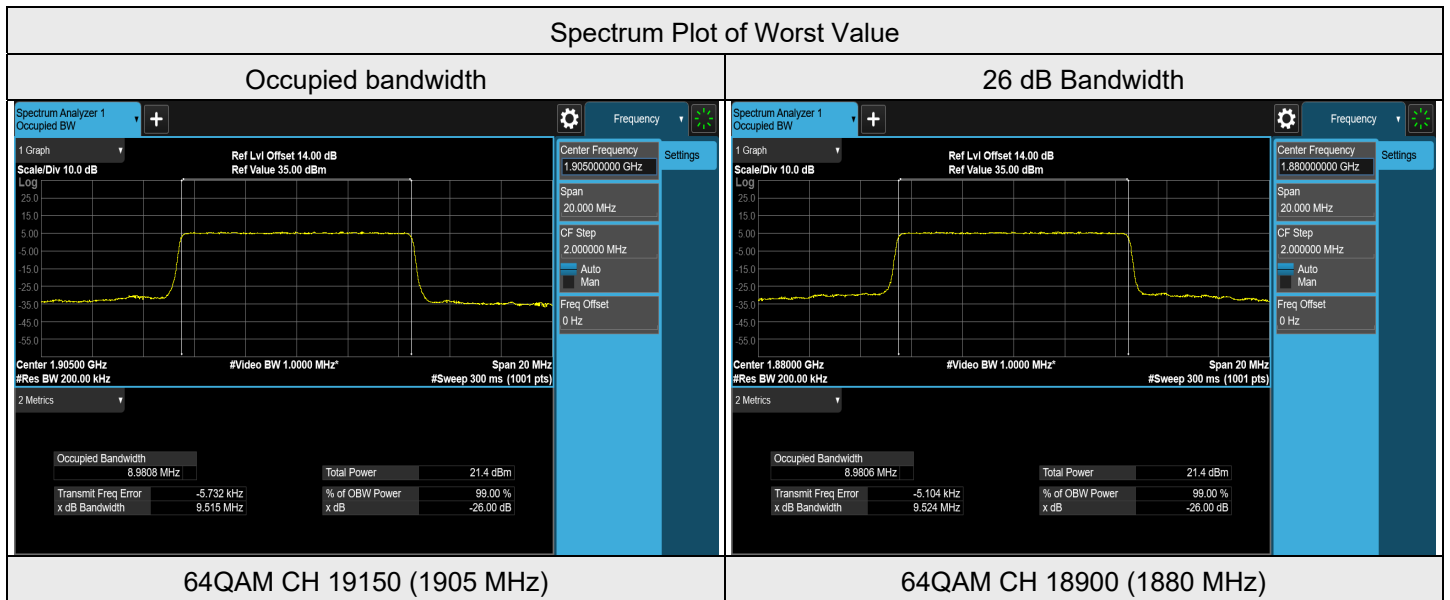






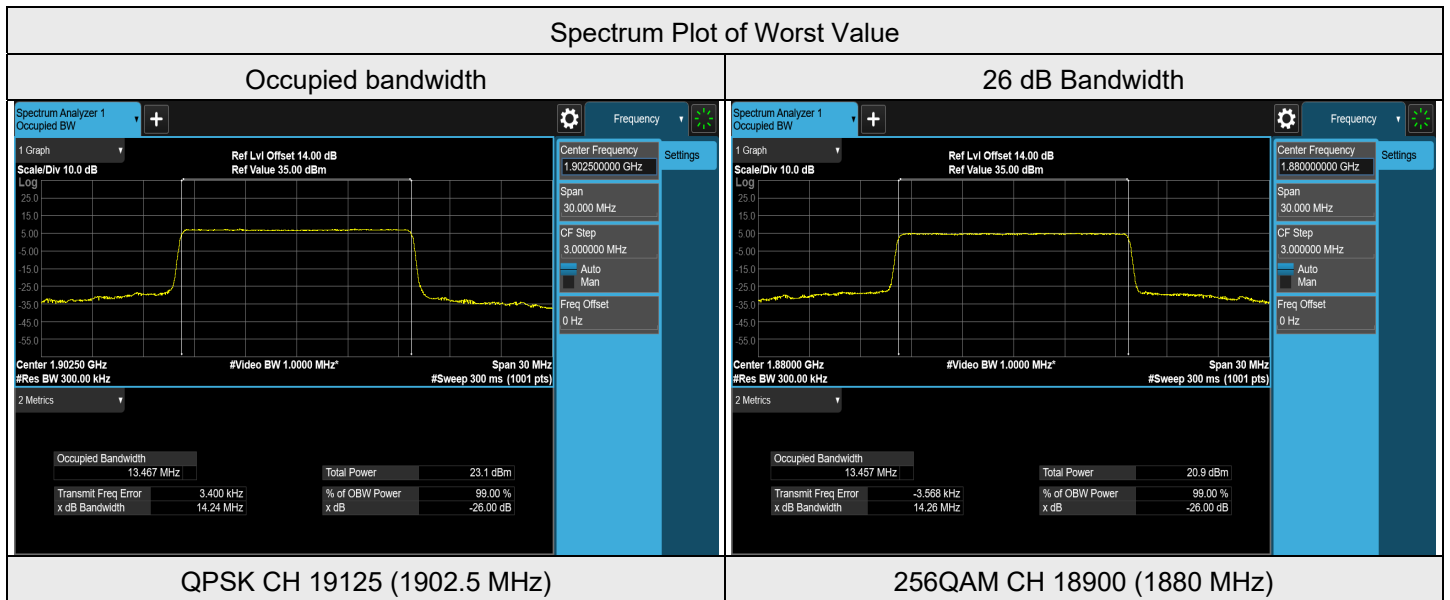
LTE Band 2, Channel Bandwidth: 10 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	18650	1855	8.9746	9.497
QPSK	18900	1880	8.9745	9.509
QPSK	19150	1905	8.9736	9.501
16QAM	18650	1855	8.9705	9.505
16QAM	18900	1880	8.9719	9.502
16QAM	19150	1905	8.9711	9.492
64QAM	18650	1855	8.9759	9.510
64QAM	18900	1880	8.9806	9.524
64QAM	19150	1905	8.9808	9.515
256QAM	18650	1855	8.9715	9.511
256QAM	18900	1880	8.9774	9.516
256QAM	19150	1905	8.9718	9.516



LTE Band 2, Channel Bandwidth: 15 MHz

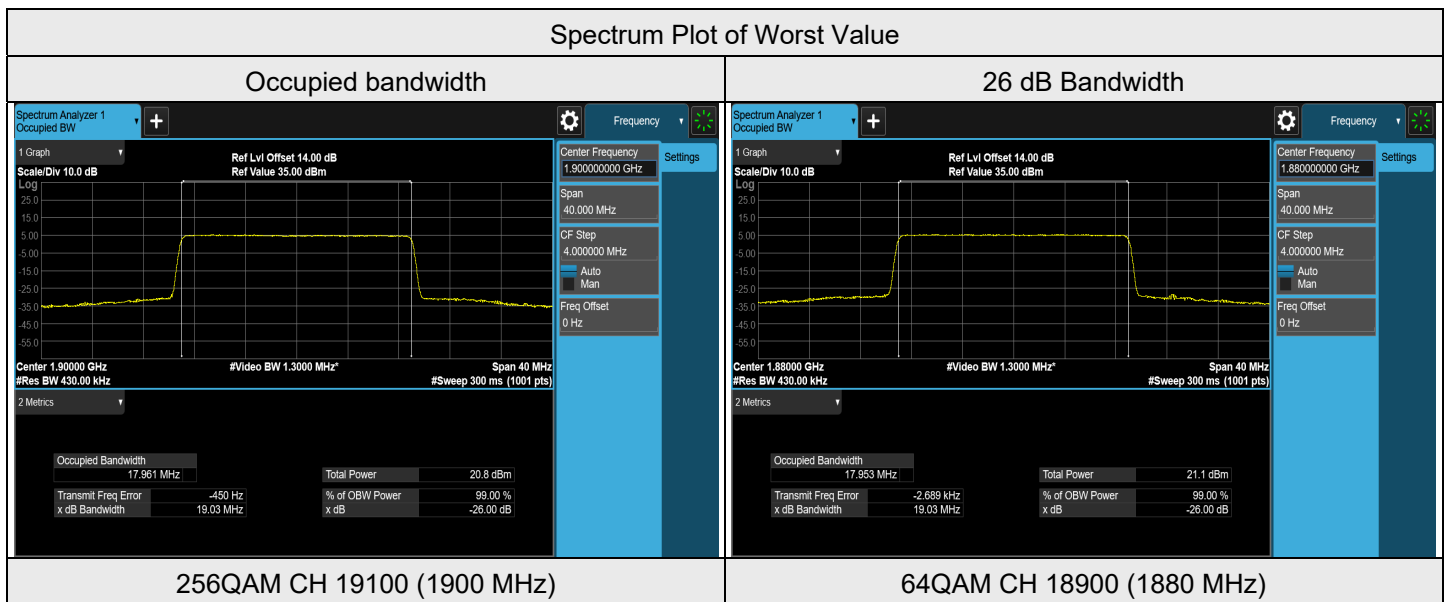
Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	18675	1857.5	13.4617	14.232
QPSK	18900	1880	13.4557	14.232
QPSK	19125	1902.5	13.4674	14.237
16QAM	18675	1857.5	13.4574	14.244
16QAM	18900	1880	13.4533	14.225
16QAM	19125	1902.5	13.4563	14.230
64QAM	18675	1857.5	13.4526	14.237
64QAM	18900	1880	13.4567	14.238
64QAM	19125	1902.5	13.4551	14.238
256QAM	18675	1857.5	13.4584	14.247
256QAM	18900	1880	13.4570	14.259
256QAM	19125	1902.5	13.4636	14.243





LTE Band 2, Channel Bandwidth: 20 MHz

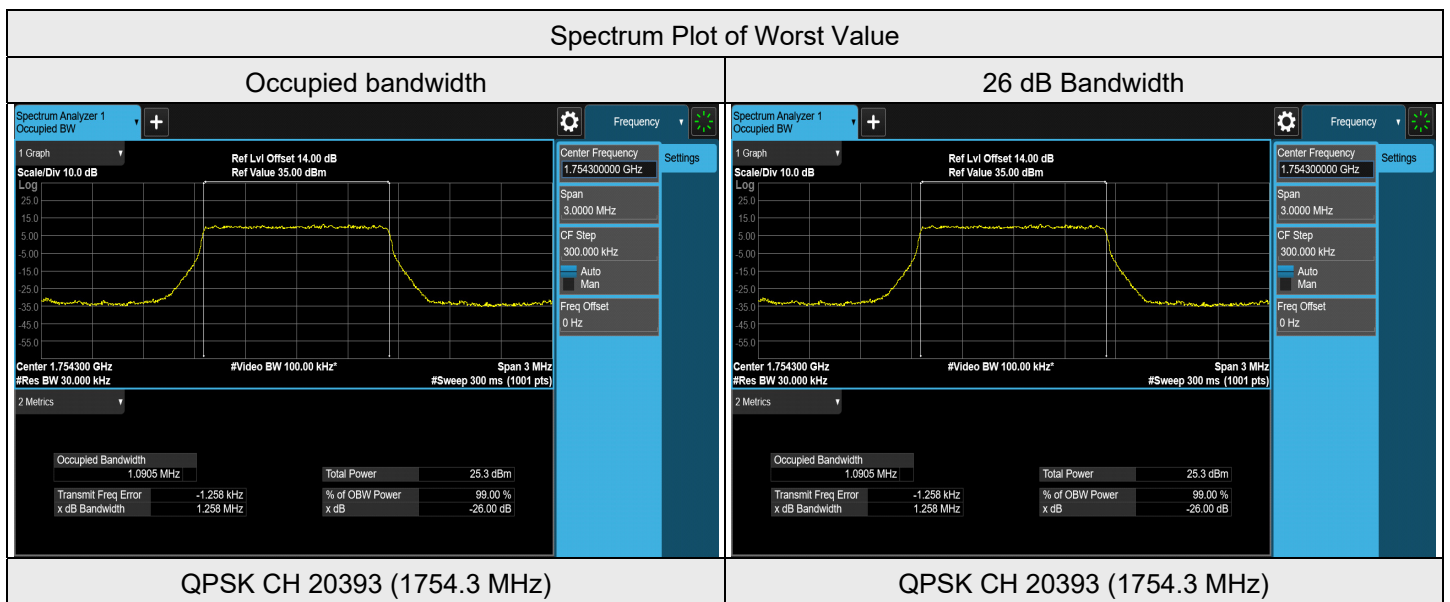
Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	18700	1860	17.9340	19.012
QPSK	18900	1880	17.9357	19.020
QPSK	19100	1900	17.9483	19.007
16QAM	18700	1860	17.9467	19.023
16QAM	18900	1880	17.9575	19.020
16QAM	19100	1900	17.9588	19.025
64QAM	18700	1860	17.9477	19.027
64QAM	18900	1880	17.9527	19.029
64QAM	19100	1900	17.9530	19.020
256QAM	18700	1860	17.9498	19.021
256QAM	18900	1880	17.9515	19.027
256QAM	19100	1900	17.9606	19.025



7.4.7 LTE Band 4

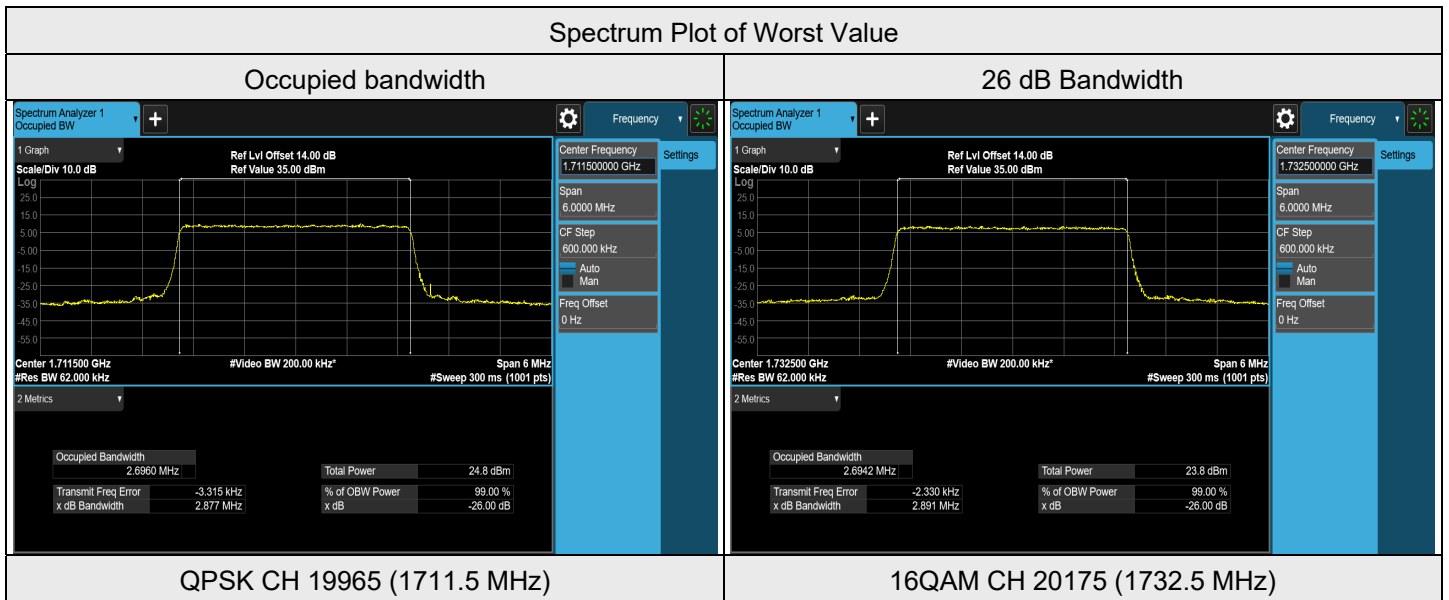
LTE Band 4, Channel Bandwidth: 1.4 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	19957	1710.7	1.0896	1.254
QPSK	20175	1732.5	1.0904	1.253
QPSK	20393	1754.3	1.0905	1.258
16QAM	19957	1710.7	1.0875	1.249
16QAM	20175	1732.5	1.0885	1.244
16QAM	20393	1754.3	1.0876	1.247
64QAM	19957	1710.7	1.0886	1.245
64QAM	20175	1732.5	1.0880	1.253
64QAM	20393	1754.3	1.0880	1.249
256QAM	19957	1710.7	1.0842	1.235
256QAM	20175	1732.5	1.0839	1.229
256QAM	20393	1754.3	1.0844	1.233



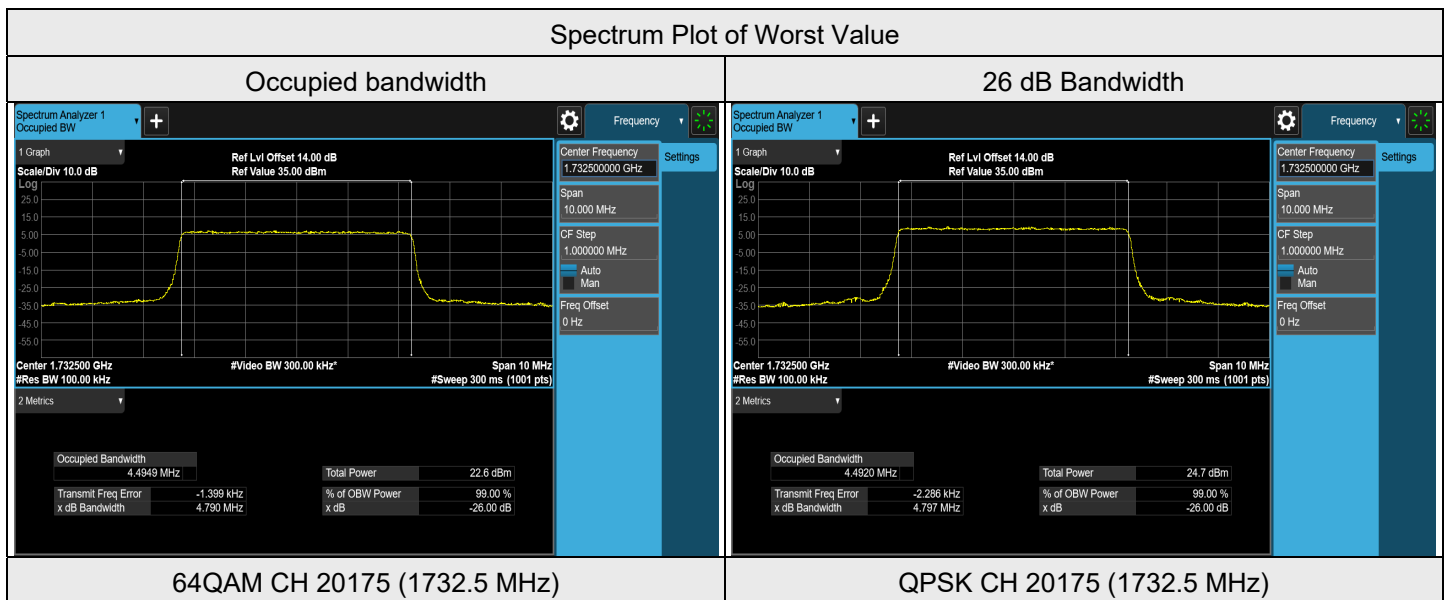
**LTE Band 4, Channel Bandwidth: 3 MHz**

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	19965	1711.5	2.6960	2.877
QPSK	20175	1732.5	2.6949	2.882
QPSK	20385	1753.5	2.6950	2.879
16QAM	19965	1711.5	2.6960	2.887
16QAM	20175	1732.5	2.6942	2.891
16QAM	20385	1753.5	2.6944	2.888
64QAM	19965	1711.5	2.6924	2.867
64QAM	20175	1732.5	2.6929	2.869
64QAM	20385	1753.5	2.6940	2.867
256QAM	19965	1711.5	2.6950	2.880
256QAM	20175	1732.5	2.6954	2.877
256QAM	20385	1753.5	2.6956	2.872



LTE Band 4, Channel Bandwidth: 5 MHz

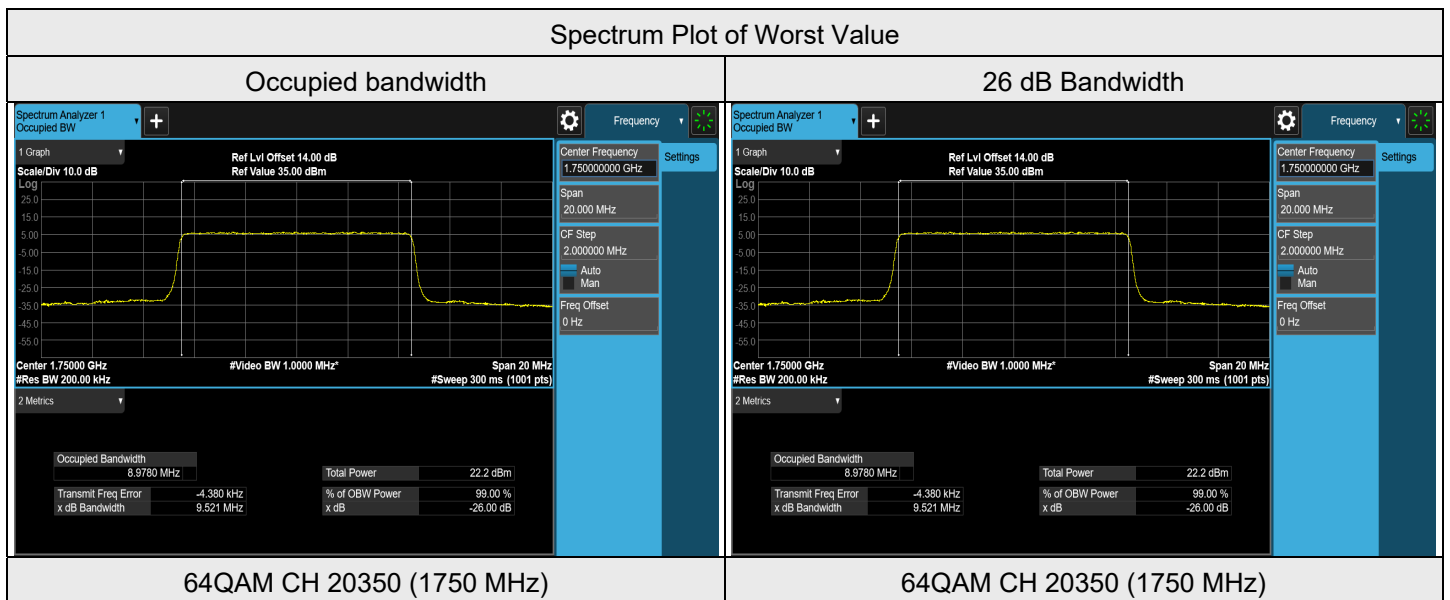
Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	19975	1712.5	4.4924	4.773
QPSK	20175	1732.5	4.4920	4.797
QPSK	20375	1752.5	4.4941	4.787
16QAM	19975	1712.5	4.4897	4.777
16QAM	20175	1732.5	4.4920	4.778
16QAM	20375	1752.5	4.4876	4.779
64QAM	19975	1712.5	4.4912	4.791
64QAM	20175	1732.5	4.4949	4.790
64QAM	20375	1752.5	4.4923	4.794
256QAM	19975	1712.5	4.4872	4.788
256QAM	20175	1732.5	4.4875	4.785
256QAM	20375	1752.5	4.4886	4.785





LTE Band 4, Channel Bandwidth: 10 MHz

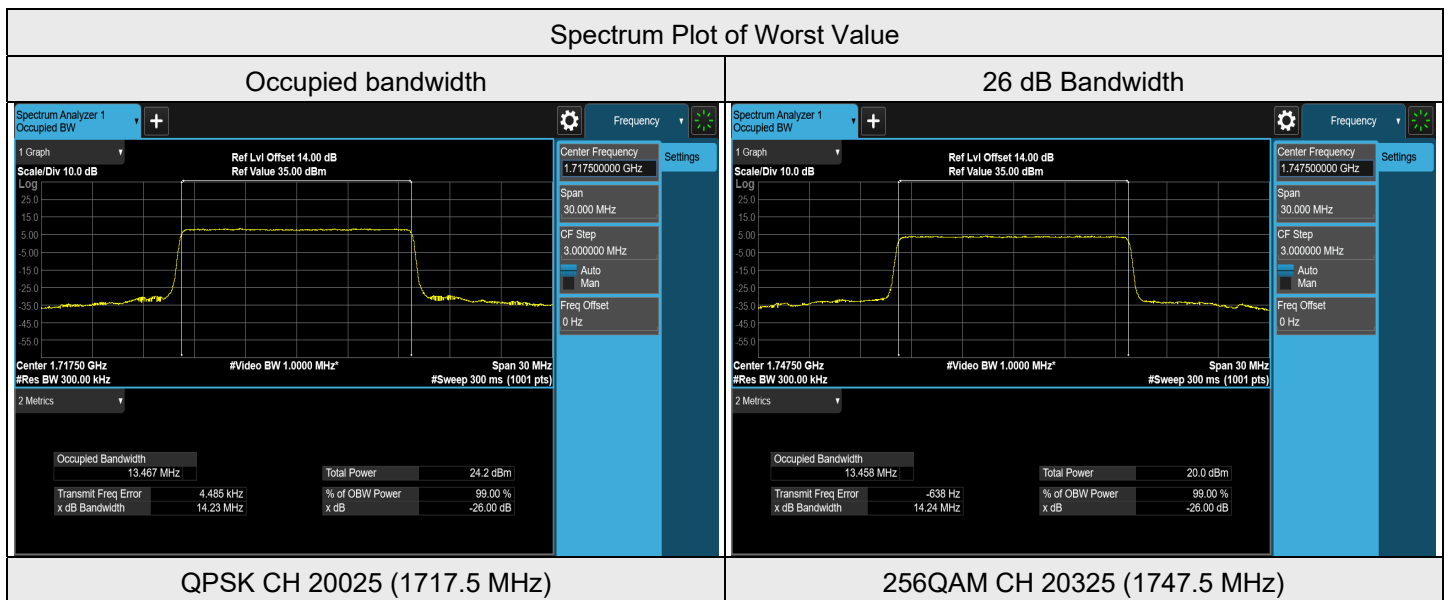
Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20000	1715	8.9758	9.507
QPSK	20175	1732.5	8.9724	9.503
QPSK	20350	1750	8.9741	9.514
16QAM	20000	1715	8.9700	9.496
16QAM	20175	1732.5	8.9742	9.495
16QAM	20350	1750	8.9716	9.503
64QAM	20000	1715	8.9751	9.518
64QAM	20175	1732.5	8.9763	9.518
64QAM	20350	1750	8.9780	9.521
256QAM	20000	1715	8.9736	9.504
256QAM	20175	1732.5	8.9686	9.510
256QAM	20350	1750	8.9714	9.512





LTE Band 4, Channel Bandwidth: 15 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20025	1717.5	13.4668	14.232
QPSK	20175	1732.5	13.4570	14.233
QPSK	20325	1747.5	13.4641	14.239
16QAM	20025	1717.5	13.4503	14.234
16QAM	20175	1732.5	13.4516	14.228
16QAM	20325	1747.5	13.4518	14.238
64QAM	20025	1717.5	13.4492	14.226
64QAM	20175	1732.5	13.4487	14.226
64QAM	20325	1747.5	13.4440	14.232
256QAM	20025	1717.5	13.4538	14.227
256QAM	20175	1732.5	13.4550	14.231
256QAM	20325	1747.5	13.4582	14.242

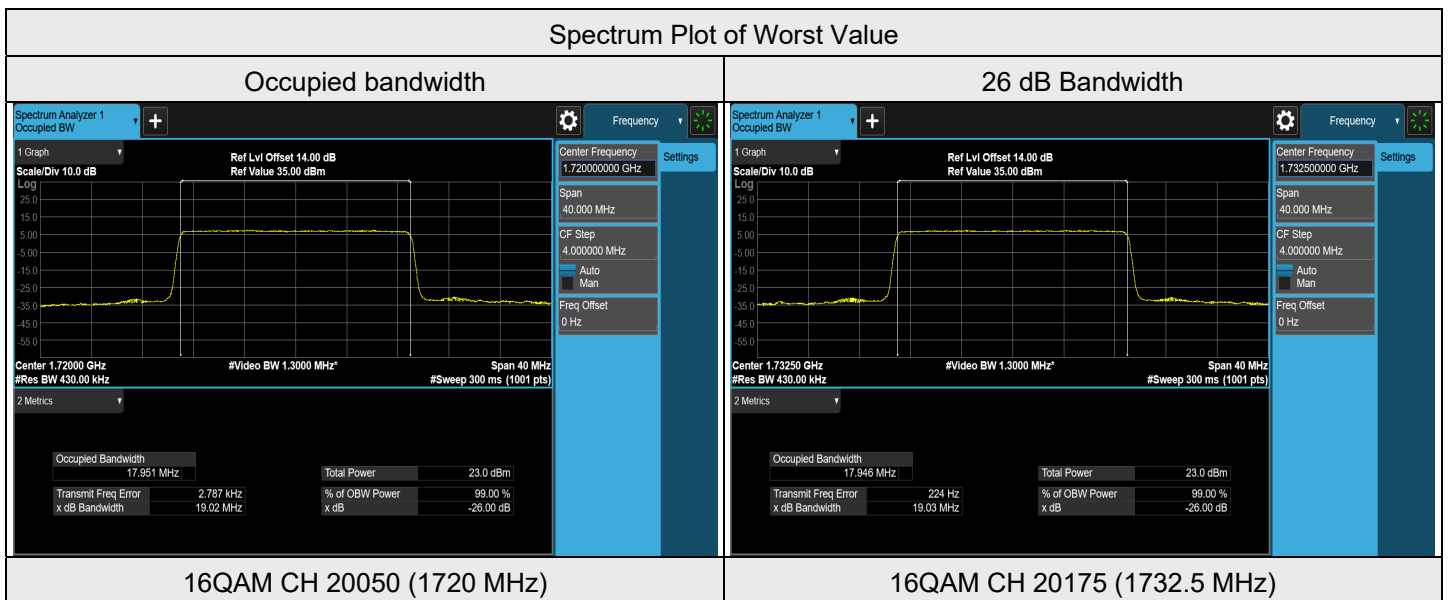






LTE Band 4, Channel Bandwidth: 20 MHz

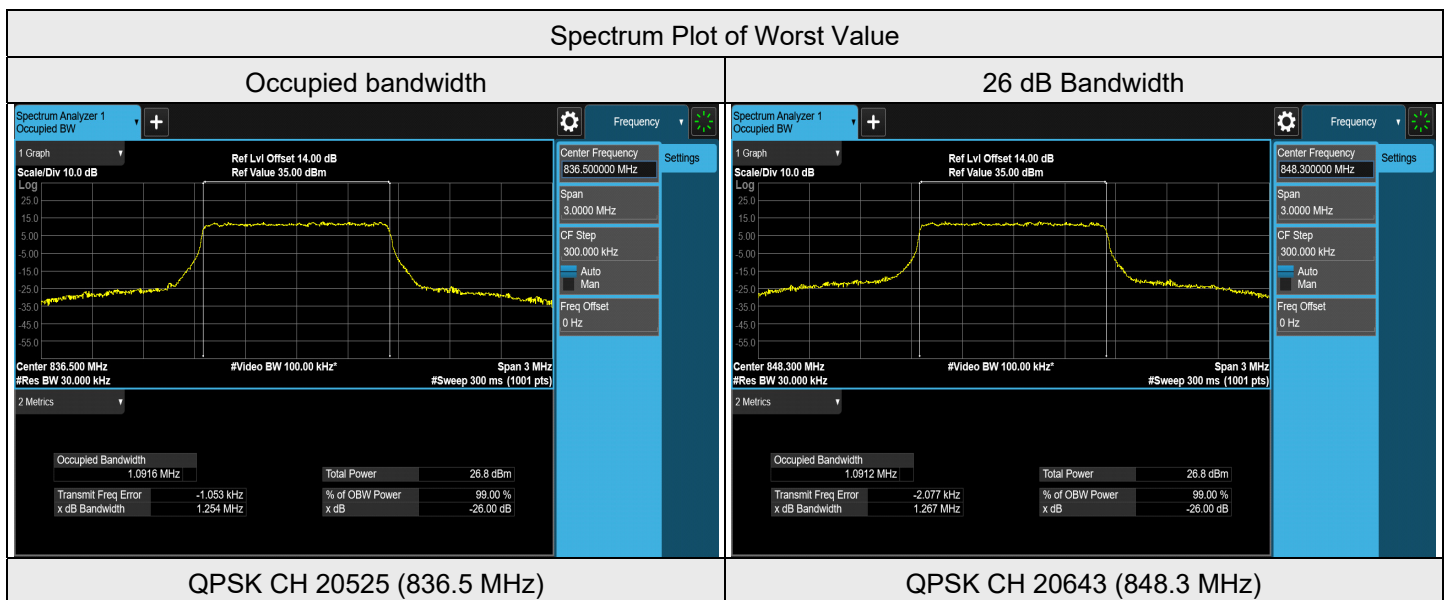
Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20050	1720	17.9359	19.021
QPSK	20175	1732.5	17.9364	19.019
QPSK	20300	1745	17.9314	19.017
16QAM	20050	1720	17.9510	19.016
16QAM	20175	1732.5	17.9462	19.030
16QAM	20300	1745	17.9491	19.015
64QAM	20050	1720	17.9443	19.026
64QAM	20175	1732.5	17.9432	19.019
64QAM	20300	1745	17.9432	19.020
256QAM	20050	1720	17.9491	19.016
256QAM	20175	1732.5	17.9480	19.015
256QAM	20300	1745	17.9410	19.023



7.4.8 LTE Band 5

LTE Band 5, Channel Bandwidth: 1.4 MHz

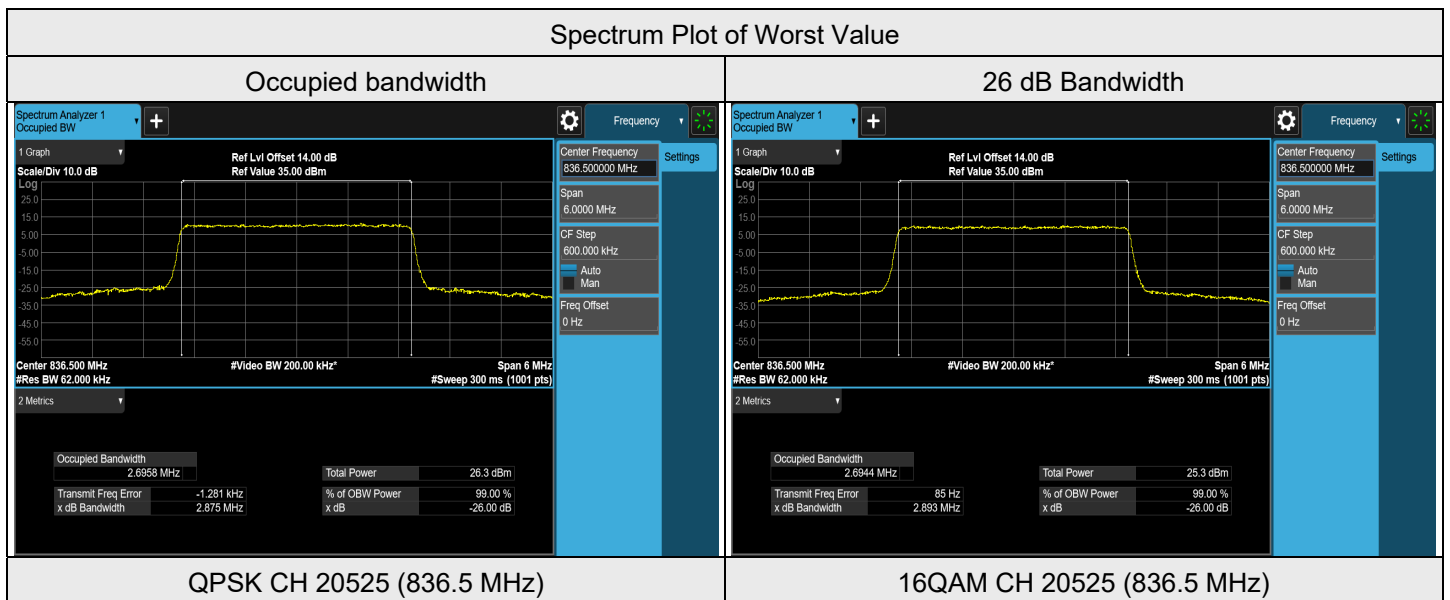
Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20407	824.7	1.0877	1.254
QPSK	20525	836.5	1.0916	1.254
QPSK	20643	848.3	1.0912	1.267
16QAM	20407	824.7	1.0879	1.241
16QAM	20525	836.5	1.0885	1.250
16QAM	20643	848.3	1.0894	1.258
64QAM	20407	824.7	1.0886	1.251
64QAM	20525	836.5	1.0890	1.254
64QAM	20643	848.3	1.0892	1.258
256QAM	20407	824.7	1.0835	1.238
256QAM	20525	836.5	1.0837	1.242
256QAM	20643	848.3	1.0835	1.232





LTE Band 5, Channel Bandwidth: 3 MHz

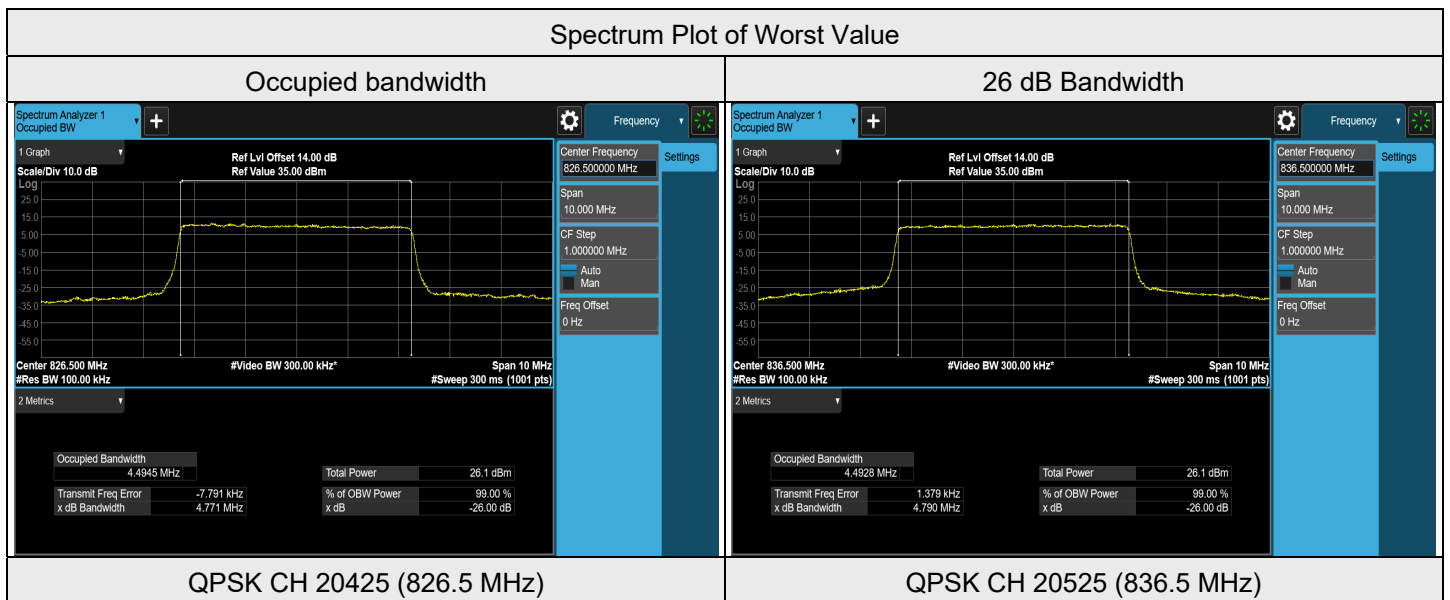
Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20415	825.5	2.6929	2.878
QPSK	20525	836.5	2.6958	2.875
QPSK	20635	847.5	2.6952	2.877
16QAM	20415	825.5	2.6943	2.880
16QAM	20525	836.5	2.6944	2.893
16QAM	20635	847.5	2.6947	2.885
64QAM	20415	825.5	2.6938	2.865
64QAM	20525	836.5	2.6943	2.866
64QAM	20635	847.5	2.6926	2.866
256QAM	20415	825.5	2.6948	2.879
256QAM	20525	836.5	2.6944	2.884
256QAM	20635	847.5	2.6937	2.874





LTE Band 5, Channel Bandwidth: 5 MHz

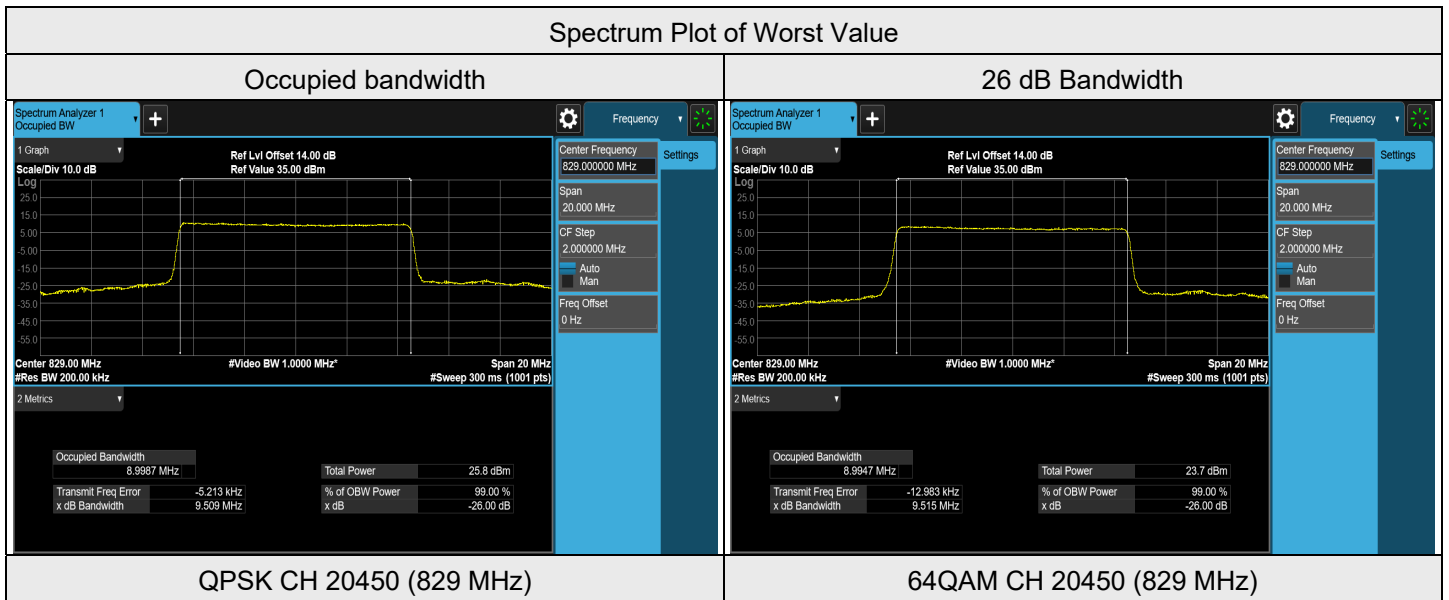
Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20425	826.5	4.4945	4.771
QPSK	20525	836.5	4.4928	4.790
QPSK	20625	846.5	4.4905	4.784
16QAM	20425	826.5	4.4897	4.770
16QAM	20525	836.5	4.4886	4.773
16QAM	20625	846.5	4.4894	4.784
64QAM	20425	826.5	4.4933	4.786
64QAM	20525	836.5	4.4934	4.788
64QAM	20625	846.5	4.4940	4.788
256QAM	20425	826.5	4.4872	4.771
256QAM	20525	836.5	4.4826	4.787
256QAM	20625	846.5	4.4853	4.778





LTE Band 5, Channel Bandwidth: 10 MHz

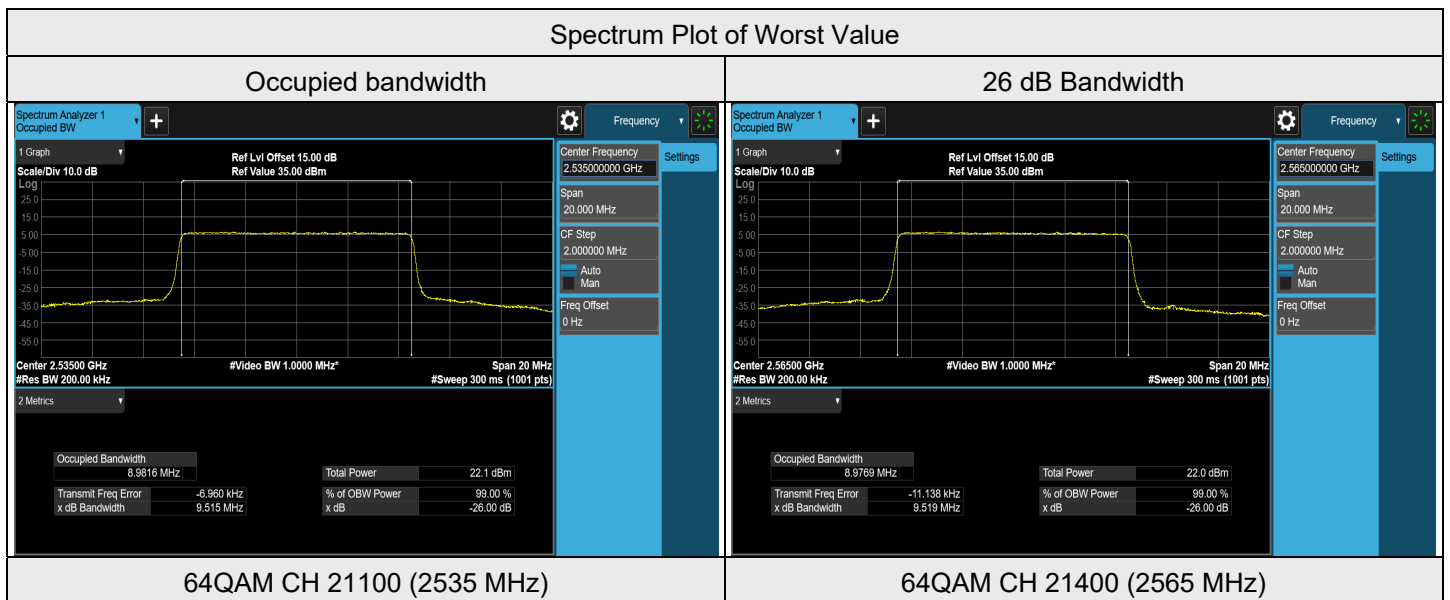
Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20450	829	8.9987	9.509
QPSK	20525	836.5	8.9674	9.506
QPSK	20600	844	8.9757	9.502
16QAM	20450	829	8.9952	9.501
16QAM	20525	836.5	8.9665	9.489
16QAM	20600	844	8.9742	9.498
64QAM	20450	829	8.9947	9.515
64QAM	20525	836.5	8.9673	9.503
64QAM	20600	844	8.9769	9.511
256QAM	20450	829	8.9871	9.497
256QAM	20525	836.5	8.9590	9.488
256QAM	20600	844	8.9689	9.505





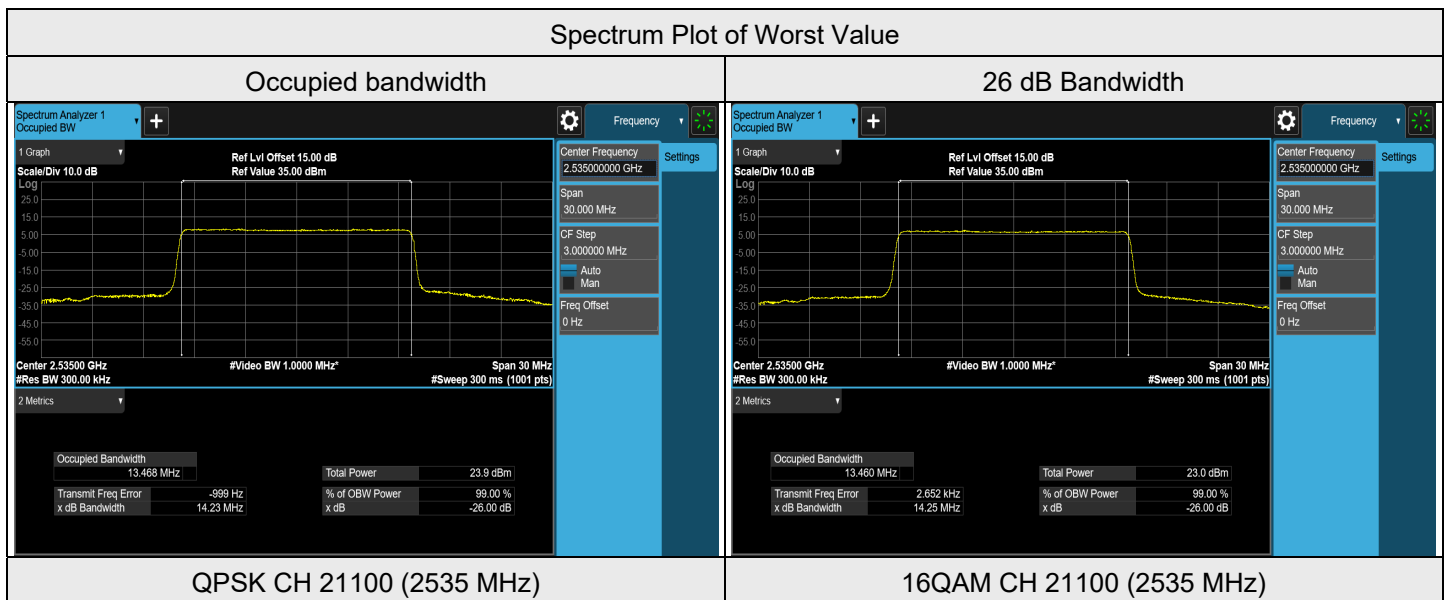
**LTE Band 7, Channel Bandwidth: 10 MHz**

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20800	2505	8.9721	9.510
QPSK	21100	2535	8.9752	9.507
QPSK	21400	2565	8.9744	9.456
16QAM	20800	2505	8.9698	9.501
16QAM	21100	2535	8.9755	9.511
16QAM	21400	2565	8.9653	9.504
64QAM	20800	2505	8.9706	9.499
64QAM	21100	2535	8.9816	9.515
64QAM	21400	2565	8.9769	9.519
256QAM	20800	2505	8.9637	9.506
256QAM	21100	2535	8.9640	9.463
256QAM	21400	2565	8.9686	9.504



LTE Band 7, Channel Bandwidth: 15 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20825	2507.5	13.4133	14.010
QPSK	21100	2535	13.4680	14.228
QPSK	21375	2562.5	13.4346	14.017
16QAM	20825	2507.5	13.4356	14.222
16QAM	21100	2535	13.4598	14.253
16QAM	21375	2562.5	13.4513	14.222
64QAM	20825	2507.5	13.4382	14.219
64QAM	21100	2535	13.4494	14.222
64QAM	21375	2562.5	13.4431	14.218
256QAM	20825	2507.5	13.4386	14.236
256QAM	21100	2535	13.4185	13.922
256QAM	21375	2562.5	13.4531	14.238







LTE Band 7, Channel Bandwidth: 20 MHz

Modulation	Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	26 dB Bandwidth (MHz)
QPSK	20850	2510	17.9253	19.009
QPSK	21100	2535	17.9527	19.023
QPSK	21350	2560	17.9509	18.974
16QAM	20850	2510	17.9283	18.875
16QAM	21100	2535	17.9595	19.030
16QAM	21350	2560	17.9392	19.007
64QAM	20850	2510	17.9170	18.916
64QAM	21100	2535	17.9500	19.030
64QAM	21350	2560	17.9351	19.007
256QAM	20850	2510	17.8965	18.731
256QAM	21100	2535	17.9473	18.855
256QAM	21350	2560	17.8591	18.588

