



FCC ID:
VBNAHIB-

Test Report No:
D556049976

Config B:

Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1						
-48.0	-30.0	-4.38493	-0.002	107	0.05	compliant
-48.0	-20.0	-5.05244	-0.002	107	0.05	compliant
-48.0	-10.0	-3.81009	-0.002	107	0.05	compliant
-48.0	0.0	-3.63930	-0.002	107	0.05	compliant
-48.0	10.0	-3.20601	-0.001	107	0.05	compliant
-48.0	30.0	3.78200	0.002	107	0.05	compliant
-48.0	40.0	-3.42193	-0.002	107	0.05	compliant
-48.0	50.0	-1.38363	-0.001	107	0.05	compliant
QPSK Modulation ANT2						
-48.0	-30.0	-3.50140	-0.002	107	0.05	compliant
-48.0	-20.0	-4.07987	-0.002	107	0.05	compliant
-48.0	-10.0	-6.374405	-0.003	107	0.05	compliant
-48.0	0.0	-3.83163	-0.002	107	0.05	compliant
-48.0	10.0	-4.32926	-0.002	107	0.05	compliant
-48.0	30.0	-2.74412	-0.001	107	0.05	compliant
-48.0	40.0	2.87634	0.001	107	0.05	compliant
-48.0	50.0	-2.96201	-0.001	107	0.05	compliant
QPSK Modulation ANT3						
-48.0	-30.0	-2.90797	-0.001	107	0.05	compliant
-48.0	-20.0	3.73933	0.002	107	0.05	compliant
-48.0	-10.0	-5.33087	-0.002	107	0.05	compliant
-48.0	0.0	-3.15328	-0.001	107	0.05	compliant
-48.0	10.0	2.93678	0.001	107	0.05	compliant
-48.0	30.0	-2.62475	-0.001	107	0.05	compliant
-48.0	40.0	-3.34548	-0.002	107	0.05	compliant
-48.0	50.0	-3.36376	-0.002	107	0.05	compliant
QPSK Modulation ANT4						
-48.0	-30.0	-3.20773	-0.001	107	0.05	compliant
-48.0	-20.0	-2.77952	-0.001	107	0.05	compliant
-48.0	-10.0	-4.71623	-0.002	107	0.05	compliant
-48.0	0.0	-3.25680	-0.002	107	0.05	compliant
-48.0	10.0	-2.85875	-0.001	107	0.05	compliant
-48.0	30.0	-4.90044	-0.002	107	0.05	compliant
-48.0	40.0	-2.72115	-0.001	107	0.05	compliant
-48.0	50.0	-2.96470	-0.001	107	0.05	compliant
16QAM Modulation ANT1						



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-48.0	-30.0	-3.66975	-0.002	107	0.05	compliant
-48.0	-20.0	4.34521	0.002	107	0.05	compliant
-48.0	-10.0	-2.78386	-0.001	107	0.05	compliant
-48.0	0.0	-2.25404	-0.001	107	0.05	compliant
-48.0	10.0	1.99184	0.001	107	0.05	compliant
-48.0	30.0	-4.11984	-0.002	107	0.05	compliant
-48.0	40.0	-2.49508	-0.001	107	0.05	compliant
-48.0	50.0	-2.27360	-0.001	107	0.05	compliant
16QAM Modulation ANT2						
-48.0	-30.0	-3.10574	-0.001	107	0.05	compliant
-48.0	-20.0	-4.64208	-0.002	107	0.05	compliant
-48.0	-10.0	-3.32631	-0.002	107	0.05	compliant
-48.0	0.0	-1.98729	-0.001	107	0.05	compliant
-48.0	10.0	-2.92917	-0.001	107	0.05	compliant
-48.0	30.0	3.02492	0.001	107	0.05	compliant
-48.0	40.0	2.62200	0.001	107	0.05	compliant
-48.0	50.0	-3.38466	-0.002	107	0.05	compliant
16QAM Modulation ANT3						
-48.0	-30.0	4.28224	0.002	107	0.05	compliant
-48.0	-20.0	-3.16087	-0.001	107	0.05	compliant
-48.0	-10.0	-1.33100	-0.001	107	0.05	compliant
-48.0	0.0	-3.15576	-0.001	107	0.05	compliant
-48.0	10.0	-4.72911	-0.002	107	0.05	compliant
-48.0	30.0	-2.27511	-0.001	107	0.05	compliant
-48.0	40.0	-2.53699	-0.001	107	0.05	compliant
-48.0	50.0	1.81837	0.001	107	0.05	compliant
16QAM Modulation ANT4						
-48.0	-30.0	-3.24258	-0.002	107	0.05	compliant
-48.0	-20.0	3.51196	0.002	107	0.05	compliant
-48.0	-10.0	-3.72249	-0.002	107	0.05	compliant
-48.0	0.0	-2.62269	-0.001	107	0.05	compliant
-48.0	10.0	-2.73292	-0.001	107	0.05	compliant
-48.0	30.0	-3.12739	-0.001	107	0.05	compliant
-48.0	40.0	-3.05721	-0.001	107	0.05	compliant
-48.0	50.0	-2.01710	-0.001	107	0.05	compliant
64QAM Modulation ANT1						
-48.0	-30.0	-4.55957	-0.002	107	0.05	compliant
-48.0	-20.0	-3.63044	-0.002	107	0.05	compliant
-48.0	-10.0	-3.45104	-0.002	107	0.05	compliant
-48.0	0.0	-3.30098	-0.002	107	0.05	compliant
-48.0	10.0	-1.47155	-0.001	107	0.05	compliant



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-48.0	30.0	3.23057	0.002	107	0.05	compliant
-48.0	40.0	-3.19363	-0.001	107	0.05	compliant
-48.0	50.0	-2.46732	-0.001	107	0.05	compliant
64QAM Modulation ANT2						
-48.0	-30.0	-2.77629	-0.001	107	0.05	compliant
-48.0	-20.0	-2.88932	-0.001	107	0.05	compliant
-48.0	-10.0	5.25509	0.002	107	0.05	compliant
-48.0	0.0	-2.65795	-0.001	107	0.05	compliant
-48.0	10.0	-3.92291	-0.002	107	0.05	compliant
-48.0	30.0	-3.21454	-0.001	107	0.05	compliant
-48.0	40.0	-3.90191	-0.002	107	0.05	compliant
-48.0	50.0	-2.20139	-0.001	107	0.05	compliant
64QAM Modulation ANT3						
-48.0	-30.0	-3.99520	-0.002	107	0.05	compliant
-48.0	-20.0	-3.49924	-0.002	107	0.05	compliant
-48.0	-10.0	4.91622	0.002	107	0.05	compliant
-48.0	0.0	-3.22912	-0.002	107	0.05	compliant
-48.0	10.0	-3.88115	-0.002	107	0.05	compliant
-48.0	30.0	-3.76485	-0.002	107	0.05	compliant
-48.0	40.0	3.88736	0.002	107	0.05	compliant
-48.0	50.0	2.20271	0.001	107	0.05	compliant
64QAM Modulation ANT4						
-48.0	-30.0	1.89270	0.001	107	0.05	compliant
-48.0	-20.0	3.51196	0.002	107	0.05	compliant
-48.0	-10.0	-3.31613	-0.002	107	0.05	compliant
-48.0	0.0	-4.69684	-0.002	107	0.05	compliant
-48.0	10.0	2.32398	0.001	107	0.05	compliant
-48.0	30.0	-2.24444	-0.001	107	0.05	compliant
-48.0	40.0	-2.10587	-0.001	107	0.05	compliant
-48.0	50.0	-1.99095	-0.001	107	0.05	compliant
256QAM Modulation ANT1						
-48.0	-30	-5.47708	-0.003	107	0.05	compliant
-48.0	-20	-4.17887	-0.002	107	0.05	compliant
-48.0	-10	-3.39313	-0.002	107	0.05	compliant
-48.0	0	-5.79807	-0.003	107	0.05	compliant
-48.0	10	-3.34101	-0.002	107	0.05	compliant
-48.0	30	-4.11984	-0.002	107	0.05	compliant
-48.0	40	2.66351	0.001	107	0.05	compliant
-48.0	50	-2.57130	-0.001	107	0.05	compliant
256QAM Modulation ANT2						
-48.0	-30	3.32774	0.002	107	0.05	compliant



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-48.0	-20	3.342811	0.002	107	0.05	compliant
-48.0	-10	-3.12811	-0.001	107	0.05	compliant
-48.0	0	-3.14483	-0.001	107	0.05	compliant
-48.0	10	-1.24442	-0.001	107	0.05	compliant
-48.0	30	-3.34991	-0.002	107	0.05	compliant
-48.0	40	2.71591	0.001	107	0.05	compliant
-48.0	50	3.67739	0.002	107	0.05	compliant
256QAM Modulation ANT3						
-48.0	-30	-3.57954	-0.002	107	0.05	compliant
-48.0	-20	-3.71966	-0.002	107	0.05	compliant
-48.0	-10	-2.54279	-0.001	107	0.05	compliant
-48.0	0	-3.15328	-0.001	107	0.05	compliant
-48.0	10	3.46360	0.002	107	0.05	compliant
-48.0	30	-3.47759	-0.002	107	0.05	compliant
-48.0	40	-2.02870	-0.001	107	0.05	compliant
-48.0	50	-3.21129	-0.001	107	0.05	compliant
256QAM Modulation ANT4						
-48.0	-30	-2.78724	-0.001	107	0.05	compliant
-48.0	-20	5.59985	0.003	107	0.05	compliant
-48.0	-10	-2.62658	-0.001	107	0.05	compliant
-48.0	0	-2.06560	-0.001	107	0.05	compliant
-48.0	10	3.09187	0.001	107	0.05	compliant
-48.0	30	3.23306	0.002	107	0.05	compliant
-48.0	40	-3.83918	-0.002	107	0.05	compliant
-48.0	50	-5.84061	-0.003	107	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 21 Frequency stability with temp. var. (20 MHz Channel BW)



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Frequency Stability with Voltage Variation:

The EUT was placed in a climatic chamber and allowed to stabilize at +20 degrees Celsius for at least 60 minutes. With the supply voltage of the EUT set to 85% of the nominal value, the frequency error was measured. This procedure was repeated at 100% and 115% of the nominal supply voltage value.

Config A:

Carrier Frequency: 2145.0 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1						
-40.8	20.0	-3.42824	-0.002	107	0.05	compliant
-48.0	20.0	3.84421	0.002	107	0.05	compliant
-55.2	20.0	-2.59075	-0.001	107	0.05	compliant
QPSK Modulation ANT2						
-40.8	20.0	1.59122	0.001	107	0.05	compliant
-48.0	20.0	-3.79180	-0.002	107	0.05	compliant
-55.2	20.0	3.42476	0.002	107	0.05	compliant
QPSK Modulation ANT3						
-40.8	20.0	-2.77333	-0.001	107	0.05	compliant
-48.0	20.0	-5.40811	-0.003	107	0.05	compliant
-55.2	20.0	-3.66669	-0.002	107	0.05	compliant
QPSK Modulation ANT4						
-40.8	20.0	-4.34803	-0.002	107	0.05	compliant
-48.0	20.0	-4.14300	-0.002	107	0.05	compliant
-55.2	20.0	-3.63907	-0.002	107	0.05	compliant
16QAM Modulation ANT1						
-40.8	20.0	-4.18826	-0.002	107	0.05	compliant
-48.0	20.0	-3.35158	-0.002	107	0.05	compliant
-55.2	20.0	-3.16071	-0.001	107	0.05	compliant
16QAM Modulation ANT2						
-40.8	20.0	-4.85166	-0.002	107	0.05	compliant
-48.0	20.0	-3.64834	-0.002	107	0.05	compliant
-55.2	20.0	-3.23242	-0.002	107	0.05	compliant
16QAM Modulation ANT3						
-40.8	20.0	-2.27695	-0.001	107	0.05	compliant
-48.0	20.0	-3.45360	-0.002	107	0.05	compliant
-55.2	20.0	4.00484	0.002	107	0.05	compliant

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16QAM Modulation ANT4						
-40.8	20.0	2.19460	0.001	107	0.05	compliant
-48.0	20.0	-2.55329	-0.001	107	0.05	compliant
-55.2	20.0	3.78519	0.002	107	0.05	compliant
64QAM Modulation ANT1						
-40.8	20.0	-4.42446	-0.002	107	0.05	compliant
-48.0	20.0	-2.56983	-0.001	107	0.05	compliant
-55.2	20.0	-3.61937	-0.002	107	0.05	compliant
64QAM Modulation ANT2						
-40.8	20.0	4.45775	0.002	107	0.05	compliant
-48.0	20.0	1.93438	0.001	107	0.05	compliant
-55.2	20.0	2.67695	0.001	107	0.05	compliant
64QAM Modulation ANT3						
-40.8	20.0	-5.78444	-0.003	107	0.05	compliant
-48.0	20.0	2.65434	0.001	107	0.05	compliant
-55.2	20.0	-5.31033	-0.002	107	0.05	compliant
64QAM Modulation ANT4						
-40.8	20.0	-4.79217	-0.002	107	0.05	compliant
-48.0	20.0	-3.65313	-0.002	107	0.05	compliant
-55.2	20.0	-3.59839	-0.002	107	0.05	compliant
256QAM Modulation ANT1						
-40.8	20	-3.26659	-0.002	107	0.05	compliant
-48	20	-3.69572	-0.002	107	0.05	compliant
-55.2	20	-2.96731	-0.001	107	0.05	compliant
256QAM Modulation ANT2						
-40.8	20	-5.85594	-0.003	107	0.05	compliant
-48	20	-1.95016	-0.001	107	0.05	compliant
-55.2	20	2.50041	0.001	107	0.05	compliant
256QAM Modulation ANT3						
-40.8	20	-2.50884	-0.001	107	0.05	compliant
-48	20	-1.98080	-0.001	107	0.05	compliant
-55.2	20	-4.10500	-0.002	107	0.05	compliant
256QAM Modulation ANT4						
-40.8	20	-2.65717	-0.001	107	0.05	compliant
-48	20	-3.43810	-0.002	107	0.05	compliant
-55.2	20	-4.11823	-0.002	107	0.05	compliant
Measurement Uncertainty:						±1.0 Hz

Table 22 Frequency stability with voltage var. (10 MHz Channel BW)



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Config B:

Carrier Frequency: 2145.0 MHz						
Supply Voltage (DC) [V]	Ambient Temperature [°C]	Frequency Deviation		Manufacturer's Specification		Result
		[Hz]	[ppm]	[Hz]	[ppm]	
QPSK Modulation ANT1						
-40.8	20.0	-4.10330	-0.002	107	0.05	compliant
-48.0	20.0	-3.20601	-0.001	107	0.05	compliant
-55.2	20.0	-4.59942	-0.002	107	0.05	compliant
QPSK Modulation ANT2						
-40.8	20.0	-5.17908	-0.002	107	0.05	compliant
-48.0	20.0	-2.38215	-0.001	107	0.05	compliant
-55.2	20.0	-4.57216	-0.002	107	0.05	compliant
QPSK Modulation ANT3						
-40.8	20.0	-2.33665	-0.001	107	0.05	compliant
-48.0	20.0	2.75850	0.001	107	0.05	compliant
-55.2	20.0	-2.89980	-0.001	107	0.05	compliant
QPSK Modulation ANT4						
-40.8	20.0	-3.98903	-0.002	107	0.05	compliant
-48.0	20.0	-3.16662	-0.001	107	0.05	compliant
-55.2	20.0	-4.54427	-0.002	107	0.05	compliant
16QAM Modulation ANT1						
-40.8	20.0	-2.98668	-0.001	107	0.05	compliant
-48.0	20.0	1.99184	0.001	107	0.05	compliant
-55.2	20.0	-4.93676	-0.002	107	0.05	compliant
16QAM Modulation ANT2						
-40.8	20.0	4.69443	0.002	107	0.05	compliant
-48.0	20.0	-2.79610	-0.001	107	0.05	compliant
-55.2	20.0	2.17217	0.001	107	0.05	compliant
16QAM Modulation ANT3						
-40.8	20.0	3.30398	0.002	107	0.05	compliant
-48.0	20.0	-2.20569	-0.001	107	0.05	compliant
-55.2	20.0	2.34834	0.001	107	0.05	compliant
16QAM Modulation ANT4						
-40.8	20.0	-2.23830	-0.001	107	0.05	compliant
-48.0	20.0	-2.95879	-0.001	107	0.05	compliant
-55.2	20.0	3.96738	0.002	107	0.05	compliant
64QAM Modulation ANT1						
-40.8	20.0	-2.20398	-0.001	107	0.05	compliant
-48.0	20.0	-1.47155	-0.001	107	0.05	compliant
-55.2	20.0	-4.67437	-0.002	107	0.05	compliant
64QAM Modulation ANT2						

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-40.8	20.0	-3.23672	-0.002	107	0.05	compliant
-48.0	20.0	-2.44805	-0.001	107	0.05	compliant
-55.2	20.0	-3.53048	-0.002	107	0.05	compliant
64QAM Modulation ANT3						
-40.8	20.0	3.32001	0.002	107	0.05	compliant
-48.0	20.0	2.95459	0.001	107	0.05	compliant
-55.2	20.0	-4.93237	-0.002	107	0.05	compliant
64QAM Modulation ANT4						
-40.8	20.0	-2.74497	-0.001	107	0.05	compliant
-48.0	20.0	-5.06852	-0.002	107	0.05	compliant
-55.2	20.0	2.58396	0.001	107	0.05	compliant
256QAM Modulation ANT1						
-40.8	20	-3.48498	-0.002	107	0.05	compliant
-48	20	-3.34101	-0.002	107	0.05	compliant
-55.2	20	-3.72825	-0.002	107	0.05	compliant
256QAM Modulation ANT2						
-40.8	20	-4.21019	-0.002	107	0.05	compliant
-48	20	-3.74198	-0.002	107	0.05	compliant
-55.2	20	-3.24455	-0.002	107	0.05	compliant
256QAM Modulation ANT3						
-40.8	20	-2.01335	-0.001	107	0.05	compliant
-48	20	-1.44340	-0.001	107	0.05	compliant
-55.2	20	2.92423	0.001	107	0.05	compliant
256QAM Modulation ANT4						
-40.8	20	-2.53966	-0.001	107	0.05	compliant
-48	20	-4.50907	-0.002	107	0.05	compliant
-55.2	20	-3.75706	-0.002	107	0.05	compliant
Measurement Uncertainty:					±1.0 Hz	

Table 23 Frequency stability with voltage var. (20 MHz Channel BW)

The measured frequency stability was found to be compliant with the manufacturer's specifications and with all requirements of the FCC rules.



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5. TEST DATA AND SCREENSHOTS

5.1 Part List of the RF Measurement Test Equipment

No.	Test Equipment	Manufacturer & Type	Serial Number	Calibration date	Calibration due	Test No.
1	Signal Analyzer	Rohde & Schwarz: FSV 30	100781	06/2016	06/2017	1, 2, 3, 4, 6
2	Signal Analyzer	Rohde & Schwarz: FSQ 26	200206	01/2017	01/2018	1, 2, 3, 4, 6
3	Vector Network Analyzer	Rohde & Schwarz: ZVA40	100146	01/2017	01/2018	1, 2, 3, 4, 6
4	Vector Network Analyzer	Rohde & Schwarz: ZVL13	101177	07/2016	07/2017	1, 2, 3, 4, 6
5	Calibration Unit	Rohde & Schwarz: ZV-Z54	100125	06/2016	06/2017	1, 2, 3, 4, 6
6	Calibration Kit	Hewlett-Packard: HP85032B	2919A04843	07/2016	07/2017	1, 2, 3, 4, 6
7	Frequency Standard	Microsemi 8040	1622301010 16	09/2016	09/2017	6
8	Multimeter	Fluke 83	65870302	12/2016	12/2017	1, 2, 3, 4, 6
9	Humidity and Temperature Indicator	Vaisala: HMI 31	P3730008	01/2017	01/2018	1, 2, 3, 4, 6
10	DC Power Supply	Maxion: EA-PSI 8080-510	1331460000 1	cnn	-	1, 2, 3, 4, 6
11	DC Power Supply	Toellner: 8870	61247	cnn	-	1, 2, 3, 4, 6
12	Attenuator	Aeroflex/Weinschel: 66-20-33	BV3346	cnn	-	1, 2, 3, 4, 6
13	EMI Test Receiver	R&S ESIB26	100335	06/2016	06/2017	5
14	Horn Antenna	ETS-Lindgren 3116C-PA	00206990	09/2016	09/2017	5
15	Horn Antenna	ETS-Lindgren ETS3115	92148	06/2016	06/2017	5
16	Bilog Antenna	Chase CBL6112B	2003	06/2016	06/2017	5
17	Mast Controller	Maturo NCD/180 2	17210416	cnn	-	5
18	4 meter mast	Maturo TAM4.0-E	086/172109 15	cnn	-	5
19	Anechoic Chamber	S&MC	B83317-C6019	09/2016	09/2019	5
20	Amplifier	Miteq 4FSX4	902638	cnn	-	5

Table 24 Part List of the RF Measurement Test Equipment



Product Service

FCC ID:
VBNAIHIB-

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D556049976

5.2 Spectral Plots

5.2.1. Test No. 2: Modulation Characteristics

No additional measurements are required for the modulation characteristics. Please refer to test no. 3, occupied bandwidth on page 15.

Screenshots below shows information about the modulations I/Q constellation form and modulation information table, displaying error to ideal modulation symbols.

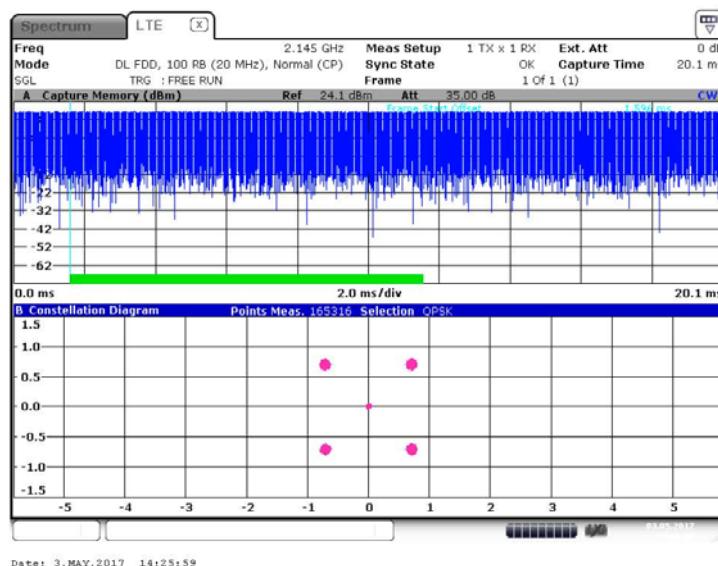


Figure 5 I/Q constellation diagram with capture buffer – QPSK (2145.0 MHz) (20MHz Channel BW)

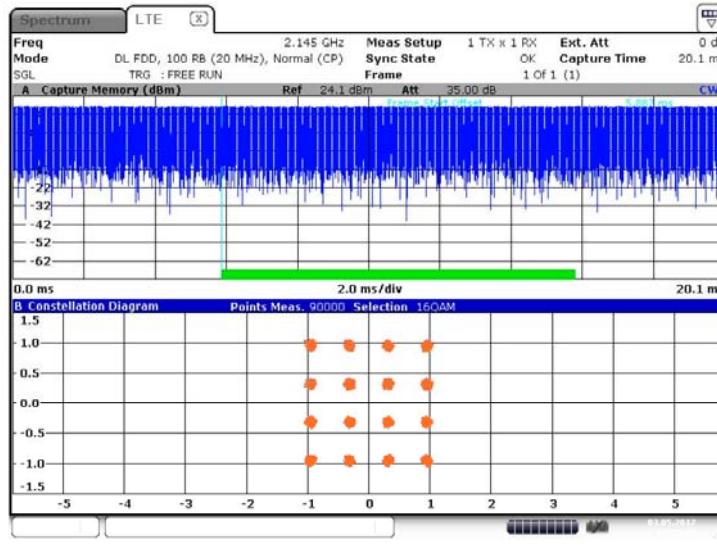


Product Service

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Result Summary						
Frame Result 1/1	Min	Mean	Limit	Max	Limit	Unit
EVM PDSCH QPSK	4.17	4.17		4.17	18.50	%
EVM PDSCH 16QAM					13.50	%
EVM PDSCH 64QAM					9.00	%
EVM PDSCH 256QAM						%
Time Alignment Error 2,1					ns	
Time Alignment Error 3,1					ns	
Time Alignment Error 4,1					ns	
Results for Selection	Subframe(s)	ALL	Selection	Antenna 1	Frame Result 1/1	
EVM All		4.03	4.15	4.26	% %	
EVM Phys. Channel		4.02	4.15	4.26	% %	
EVM Phys. Signal		4.05	4.14	4.21	% %	
Frequency Error	-0.36	1.57		4.81	Hz ppm	
Sampling Error	-0.09	0.10		0.26	ppm dB	
IQ Offset	-88.52	-72.50		-67.18	dB dB	
IQ Gain Imbalance	-0.02	-0.00		0.01	dB °	
IQ Quadrature Error	-0.08	0.01		0.07	° dBm	
RSTP	-16.91	-16.89		-16.88	dBm dBm	
OSTP	13.88	13.90		13.92	dBm dBm	
Power	13.88	13.90		13.91	dBm dB	
Crest Factor				8.94		

Date: 3.MAY.2017 14:21:44

Figure 6 I/Q constellation table with I/Q error – QPSK (2145.0 MHz) (20MHz Channel BW)**Figure 7 I/Q constellation diagram with capture buffer – 16QAM (2145.0 MHz) (20MHz Channel BW)**FCC 47 CFR part 27
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Product Service

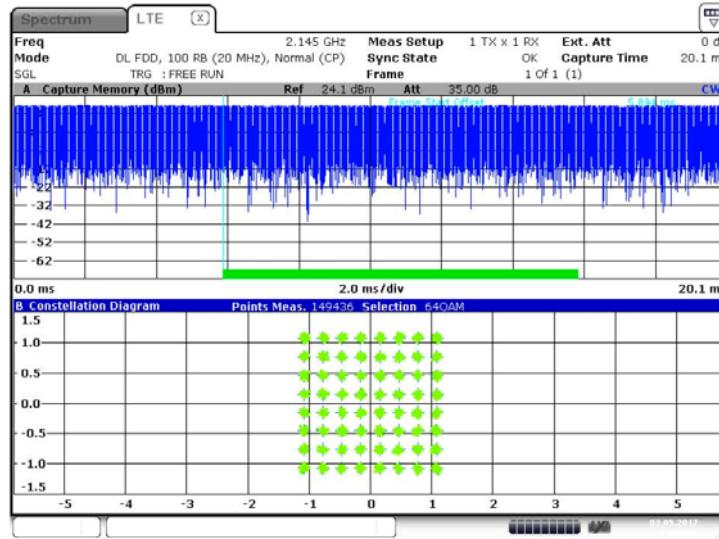
FCC ID:
VBNAHIB-

Test Report No:
D556049976



Date: 3.MAY.2017 14:28:19

Figure 8 I/Q constellation table with I/Q error – 16QAM (2145.0 MHz) (20MHz Channel BW)



Date: 3.MAY.2017 14:30:01

Figure 9 I/Q constellation diagram with capture buffer – 64QAM (2145.0 MHz) (20MHz Channel BW)



Product Service

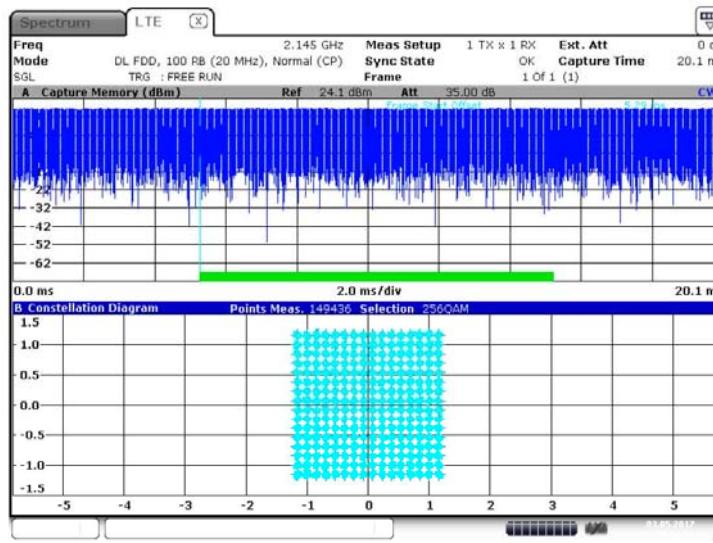
FCC ID:
VBNAHIB-

Test Report No:
D556049976



Date: 3.MAY.2017 14:29:31

Figure 10 I/Q constellation table with I/Q error – 64QAM (2145.0 MHz) (20MHz Channel BW)



Date: 3.MAY.2017 14:31:51

Figure 11 I/Q constellation diagram with capture buffer – 256QAM (2145.0 MHz) (20MHz Channel BW)



Product Service

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VBNAHIB-

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Spectrum		LTE					
Freq	Mode	2.145 GHz		Meas Setup	1 TX x 1 RX	Ext. Att	0 dB
SGL	DL FDD, 100 RB (20 MHz), Normal (CP)	Sync State	Frame	OK	Capture Time	20.1 ms	
Result Summary							
Frame Result 1/1		Min	Mean	Limit	Max	Limit	Unit
EVM PDSCH QPSK					18.50	%	
EVM PDSCH 16QAM					13.50	%	
EVM PDSCH 64QAM					9.00	%	
EVM PDSCH 256QAM	1.02	1.02		1.02		%	
Time Alignment Error 2,1						ns	
Time Alignment Error 3,1						ns	
Time Alignment Error 4,1						ns	
Results for Selection	Subframe(s)	All	Selection	Antenna 1	Frame Result 1/1		
EVM All		1.61	1.91	2.19		%	
EVM Phys. Channel		1.60	1.90	2.19		%	
EVM Phys. Signal		1.73	1.97	2.25		%	
Frequency Error	- 2.86	- 0.44		1.98		Hz	
Sampling Error	- 0.09	0.02		0.11		ppm	
IQ Offset	- 77.48	- 73.36		- 69.56		dB	
IQ Gain Imbalance	- 0.01	0.00		0.01		dB	
IQ Quadrature Error	- 0.04	0.01		0.05		°	
RSTP	- 16.70	- 16.69		- 16.69		dBm	
OSTP	13.94	14.00		14.16		dBm	
Power	14.07	14.10		14.12		dBm	
Crest Factor		8.47				dB	

Date: 3.MAY.2017 14:32:22

**Figure 12 I/Q constellation table with I/Q error – 256QAM (2145.0 MHz)
(20MHz Channel BW)**



Product Service

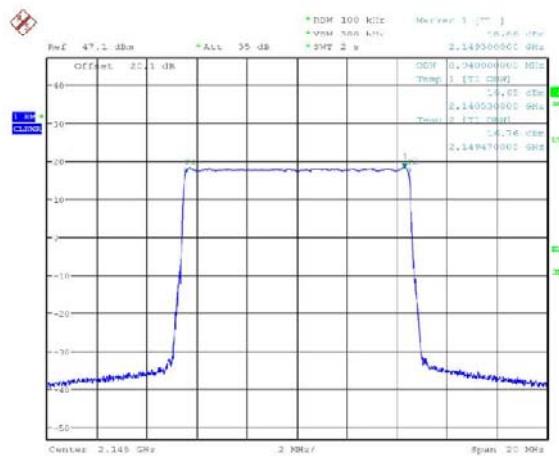
FCC ID:
VBNAHIB-

Test Report No:
D556049976

5.2.2. Test No. 3: Occupied Bandwidth

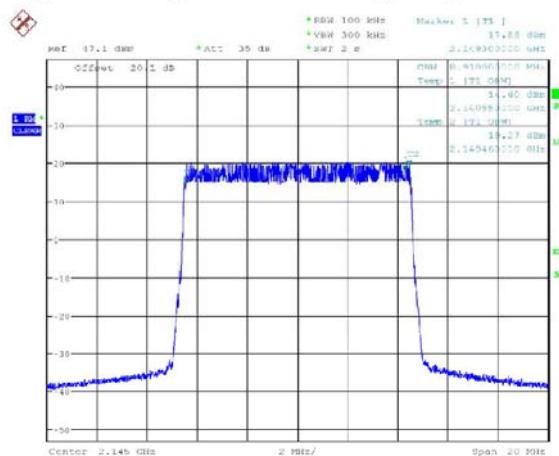
The value ‘OBW’ is the measured occupied bandwidth.

Config A ANT1:



Date: 4.MAY.2017 10:28:63

Figure 13 Occupied Bandwidth – QPSK (2145.0 MHz) (10MHz Channel BW)

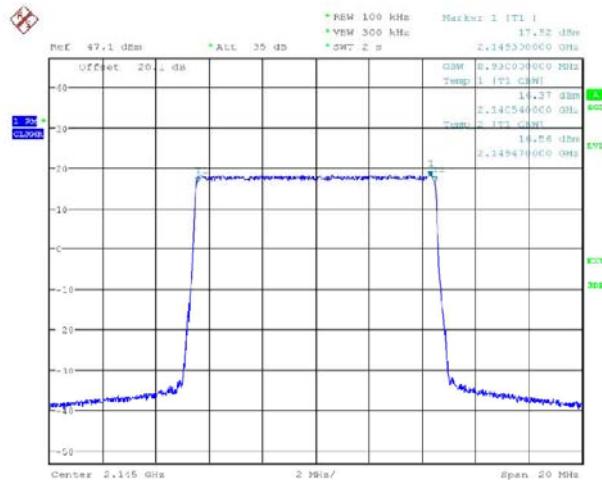


Date: 4.MAY.2017 10:32:57

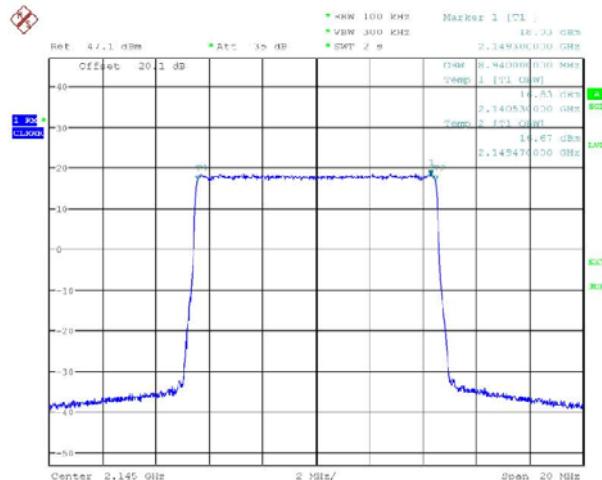
Figure 14 Occupied Bandwidth – 16QAM (2145.0 MHz) (10MHz Channel BW)



Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976

Date: 4.MAY.2017 10:35:31

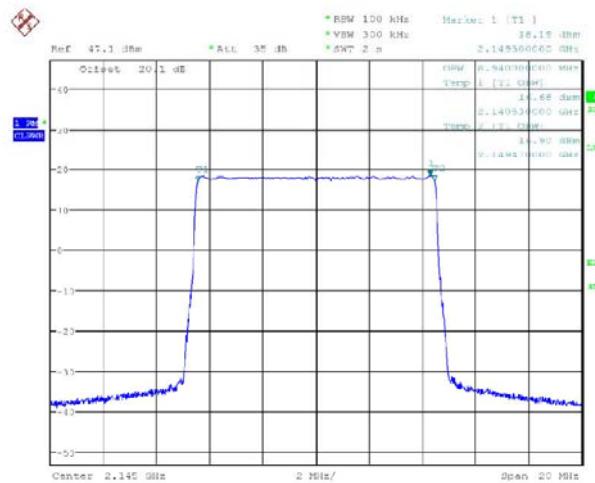
Figure 15 Occupied Bandwidth – 64QAM (2145.0 MHz) (10MHz Channel BW)

Date: 4.MAY.2017 10:39:57

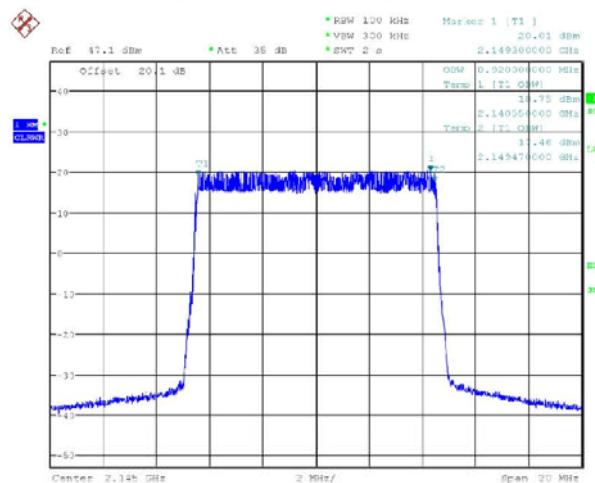
Figure 16 Occupied Bandwidth – 256QAM (2145.0 MHz) (10MHz Channel BW)



Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976**Config A ANT2:**

Date: 4.MAY.2019 08:39:59

Figure 17 Occupied Bandwidth – QPSK (2145.0 MHz) (10MHz Channel BW)

Date: 4.MAY.2017 08:44:23

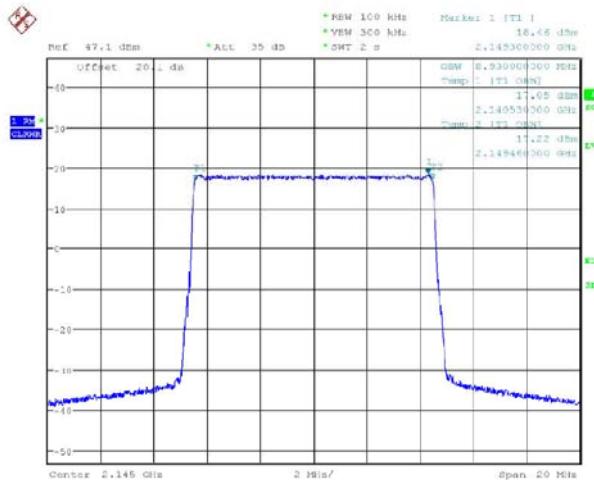
Figure 18 Occupied Bandwidth – 16QAM (2145.0 MHz) (10MHz Channel BW)FCC 47 CFR part 27
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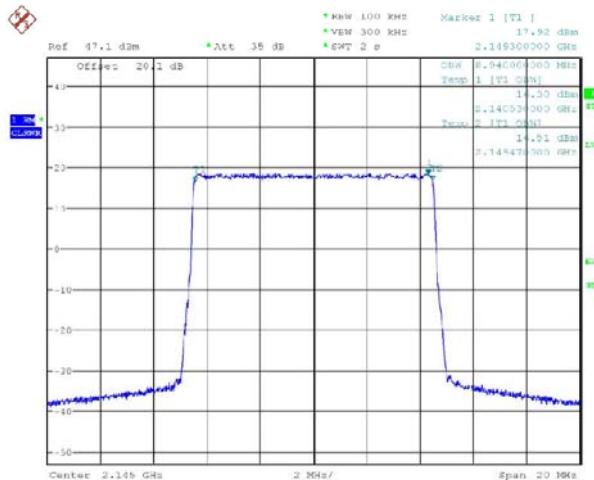
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Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976

Date: 4.MAY.2017 08:48:12

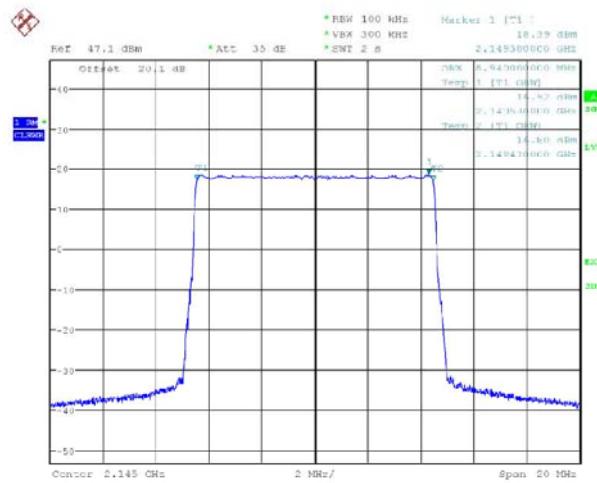
Figure 19 Occupied Bandwidth – 64QAM (2145.0 MHz) (10MHz Channel BW)

Date: 4.MAY.2017 08:51:20

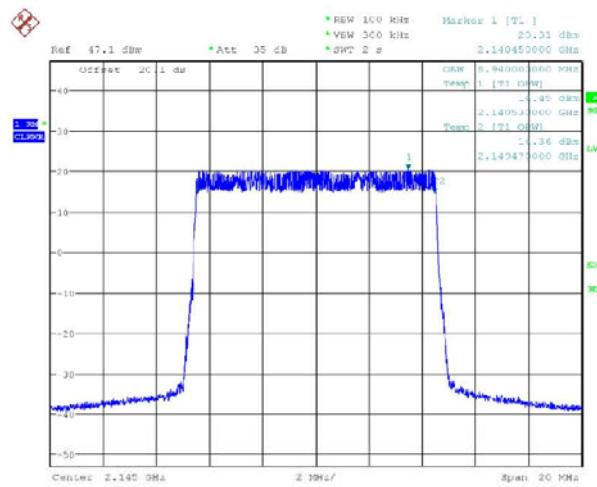
Figure 20 Occupied Bandwidth – 256QAM (2145.0 MHz) (10MHz Channel BW)



Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976**Config A ANT3:**

Date: 4.MAY.2017 07:48:03

Figure 21 Occupied Bandwidth – QPSK (2145.0 MHz) (10MHz Channel BW)

Date: 4.MAY.2017 07:55:27

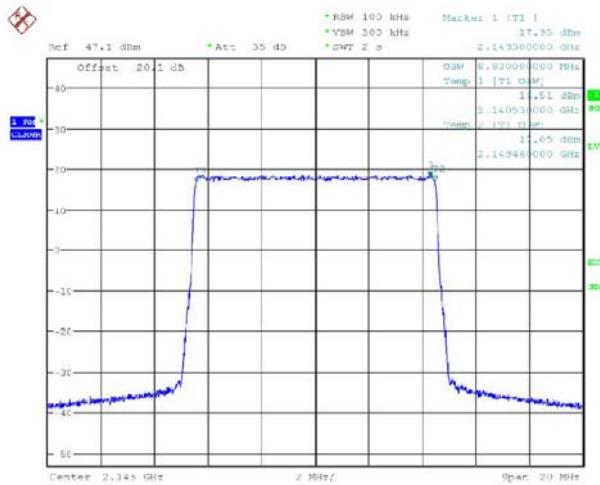
Figure 22 Occupied Bandwidth – 16QAM (2145.0 MHz) (10MHz Channel BW)FCC 47 CFR part 27
(2016)

16. May 2017

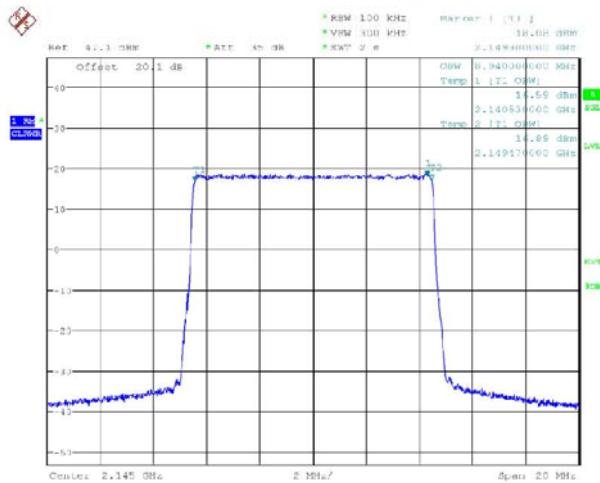
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Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976

Date: 4.MAY.2017 08:01:20

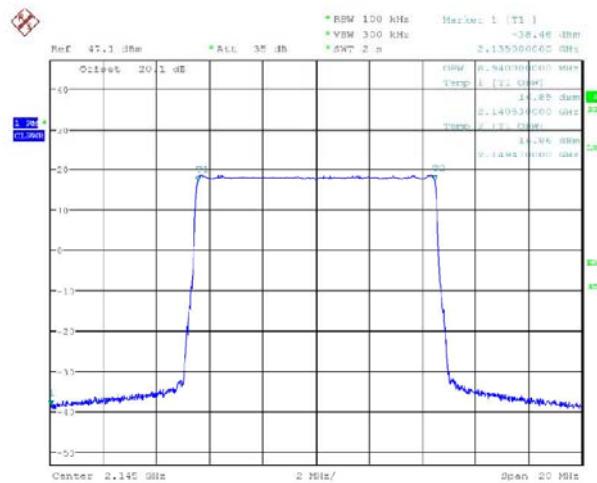
Figure 23 Occupied Bandwidth – 64QAM (2145.0 MHz) (10MHz Channel BW)

Date: 4.MAY.2017 08:04:41

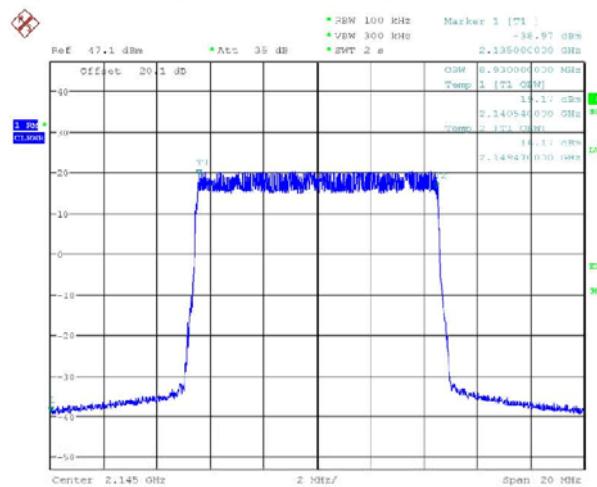
Figure 24 Occupied Bandwidth – 256QAM (2145.0 MHz) (10MHz Channel BW)



Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976**Config A ANT4:**

Date: 3.MAY.2019 13:20:30

Figure 25 Occupied Bandwidth – QPSK (2145.0 MHz) (10MHz Channel BW)

Date: 3.MAY.2017 13:24:42

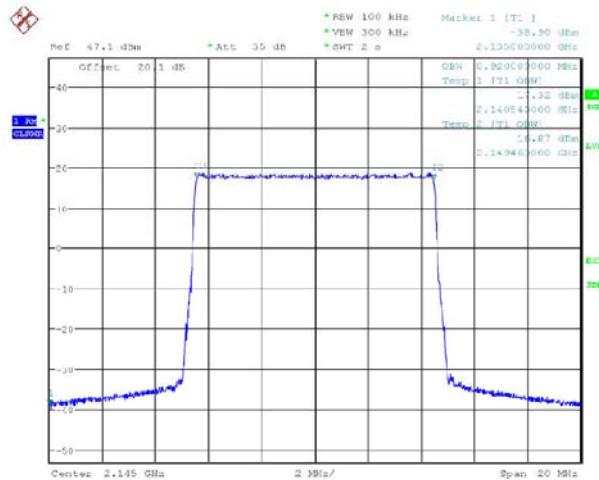
Figure 26 Occupied Bandwidth – 16QAM (2145.0 MHz) (10MHz Channel BW)FCC 47 CFR part 27
(2016)

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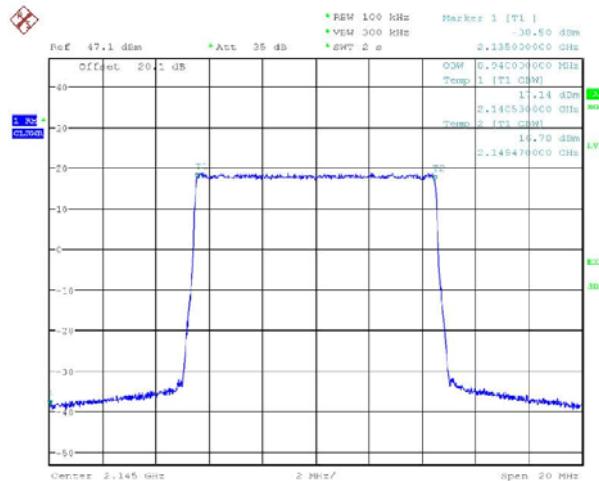
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Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976

Date: 3.MAY.2017 13:27:50

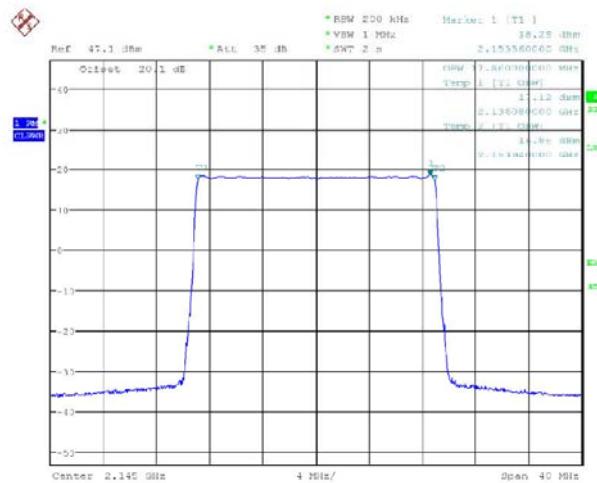
Figure 27 Occupied Bandwidth – 64QAM (2145.0 MHz) (10MHz Channel BW)

Date: 3.MAY.2017 13:31:09

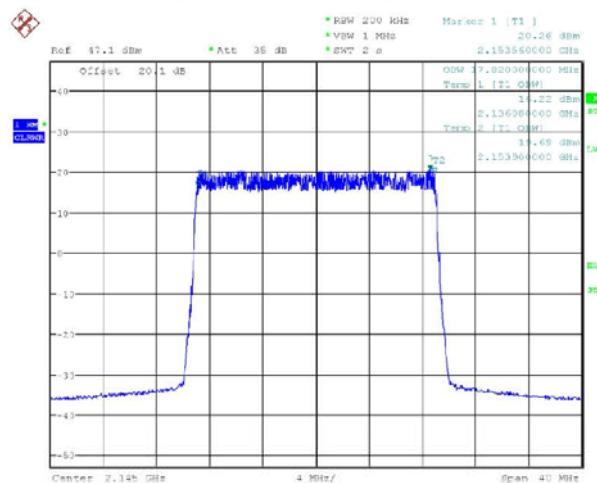
Figure 28 Occupied Bandwidth – 256QAM (2145.0 MHz) (10MHz Channel BW)



Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976**Config B ANT1:**

Date: 6.MAY.2019 12:34:20

Figure 29 Occupied Bandwidth – QPSK (2145.0 MHz) (20MHz Channel BW)

Date: 6.MAY.2017 12:35:59

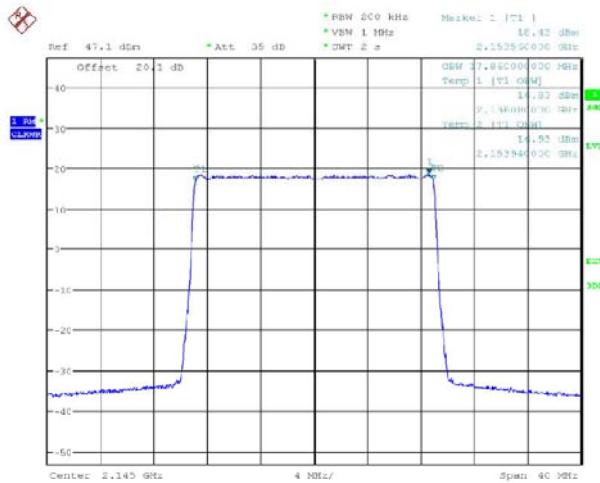
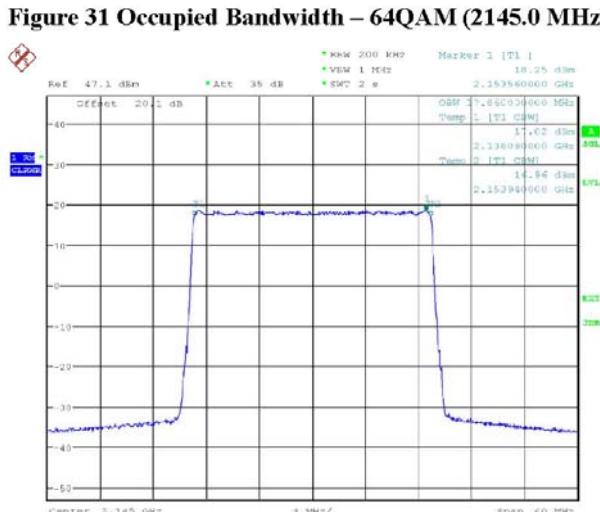
Figure 30 Occupied Bandwidth – 16QAM (2145.0 MHz) (20MHz Channel BW)FCC 47 CFR part 27
(2016)

16. May 2017

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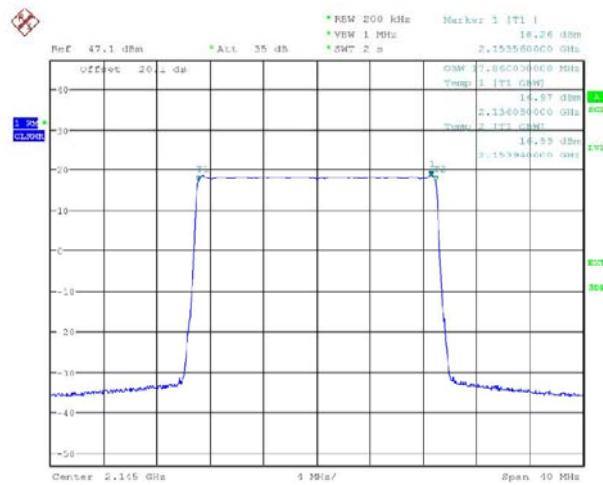


Product Service

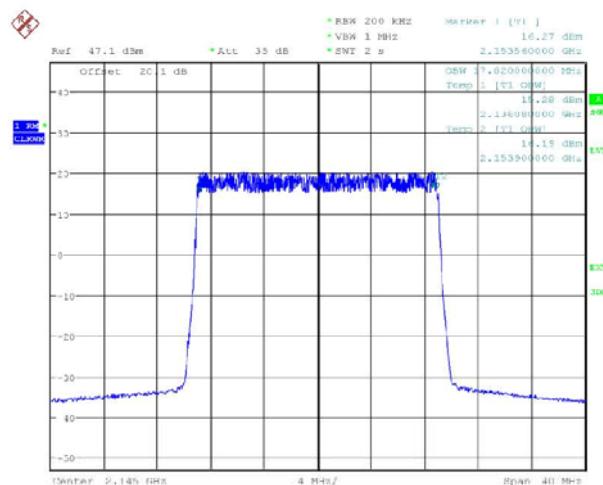
FCC ID:
VBNAHIB-Test Report No:
D556049976**Figure 31 Occupied Bandwidth – 64QAM (2145.0 MHz) (20MHz Channel BW)****Figure 32 Occupied Bandwidth – 256QAM (2145.0 MHz) (20MHz Channel BW)**



Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976**Config B ANT2:**

Date: 5.MAY.2017 07:03:04

Figure 33 Occupied Bandwidth – QPSK (2145.0 MHz) (20MHz Channel BW)

Date: 5.MAY.2017 07:14:37

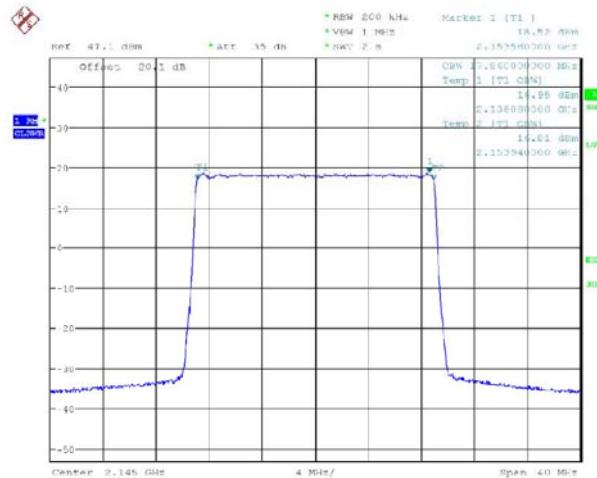
Figure 34 Occupied Bandwidth – 16QAM (2145.0 MHz) (20MHz Channel BW)FCC 47 CFR part 27
(2016)

16. May 2017

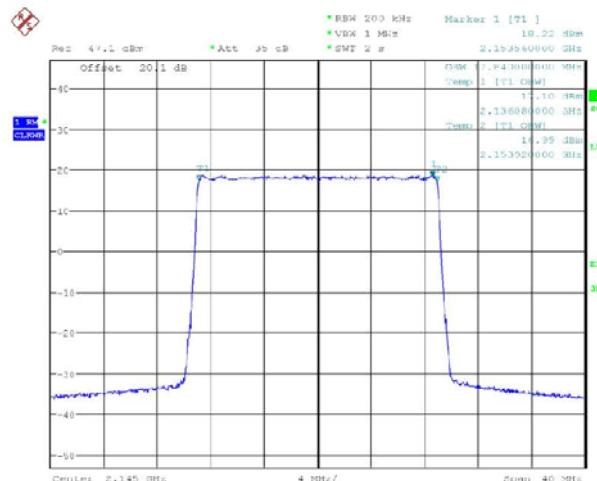
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Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976

Date: 5.MAY.2017 07:44:39

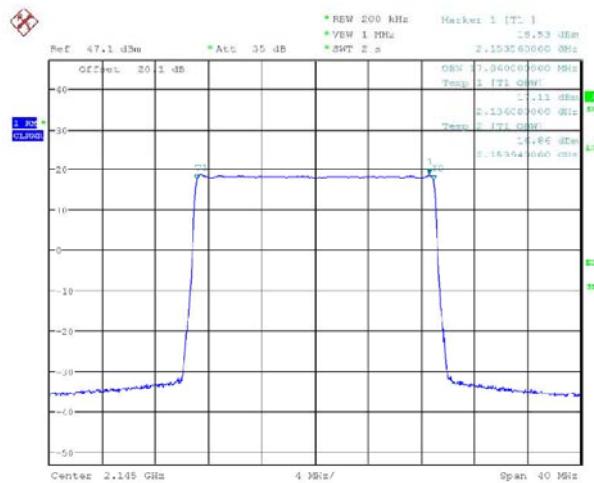
Figure 35 Occupied Bandwidth – 64QAM (2145.0 MHz) (20MHz Channel BW)

Date: 5.MAY.2017 07:47:57

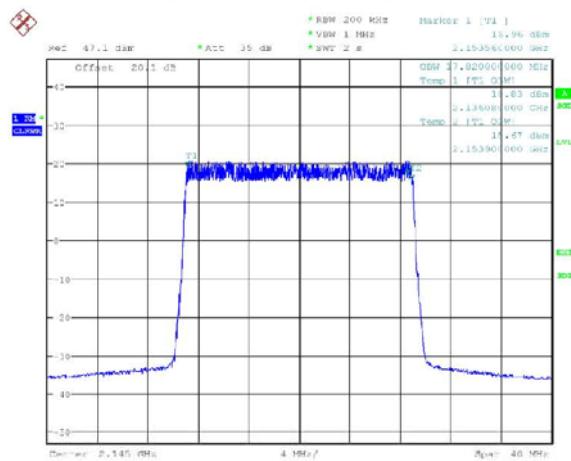
Figure 36 Occupied Bandwidth – 256QAM (2145.0 MHz) (20MHz Channel BW)



Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976**Config B ANT3:**

Date: 5.MAY.2017 00:50:50

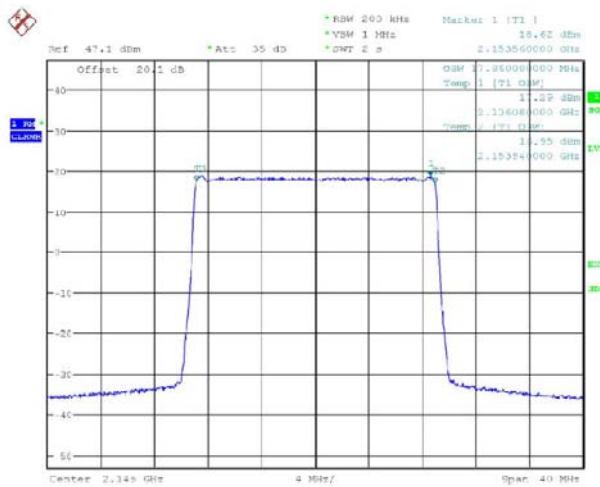
Figure 37 Occupied Bandwidth – QPSK (2145.0 MHz) (20MHz Channel BW)

Date: 5.MAY.2017 00:51:02

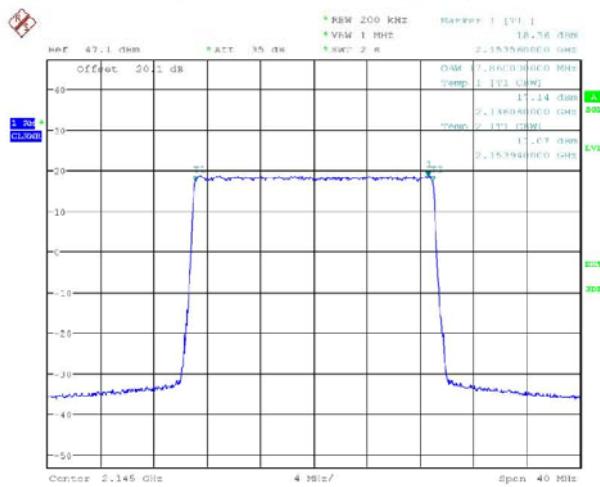
Figure 38 Occupied Bandwidth – 16QAM (2145.0 MHz) (20MHz Channel BW)



Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976

Date: 5.MAY.2017 08:57:44

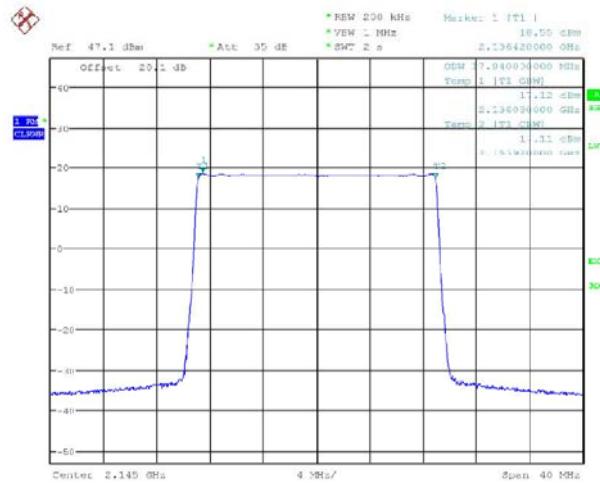
Figure 39 Occupied Bandwidth – 64QAM (2145.0 MHz) (20MHz Channel BW)

Date: 5.MAY.2017 09:01:14

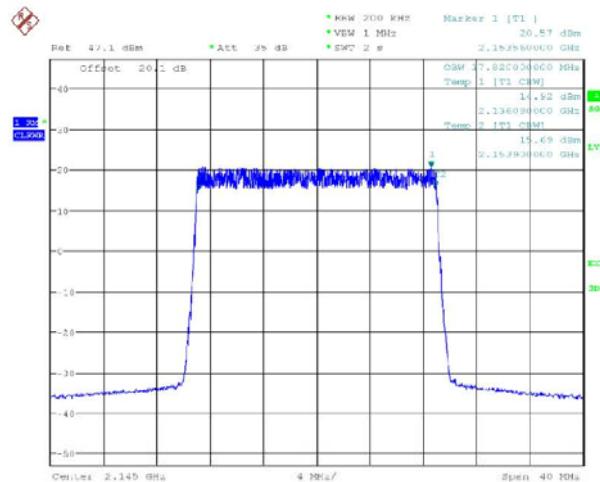
Figure 40 Occupied Bandwidth – 256QAM (2145.0 MHz) (20MHz Channel BW)



Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976**Config B ANT4:**

Date: 5.MAY.2017 10:26:01

Figure 41 Occupied Bandwidth – QPSK (2145.0 MHz) (20MHz Channel BW)

Date: 5.MAY.2017 10:29:09

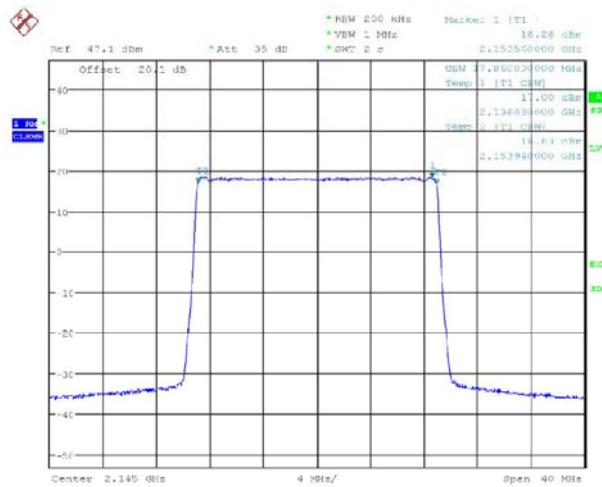
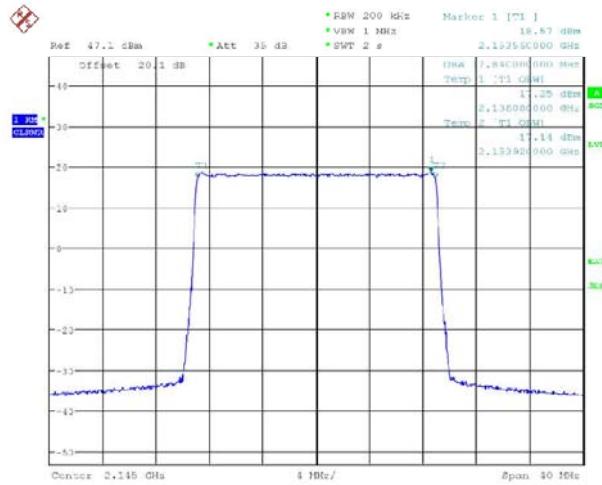
Figure 42 Occupied Bandwidth – 16QAM (2145.0 MHz) (20MHz Channel BW)FCC 47 CFR part 27
(2016)

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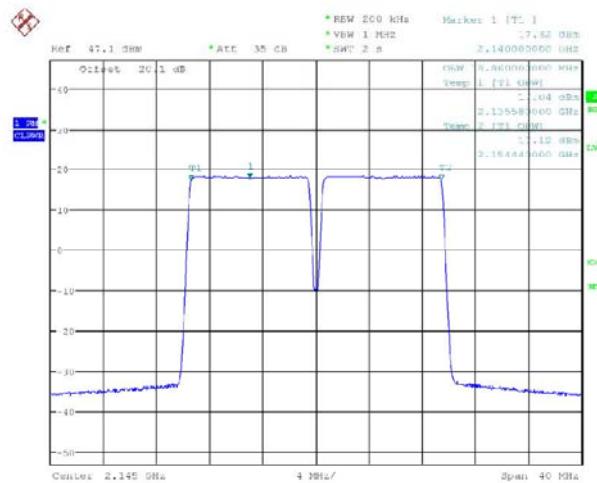


Product Service

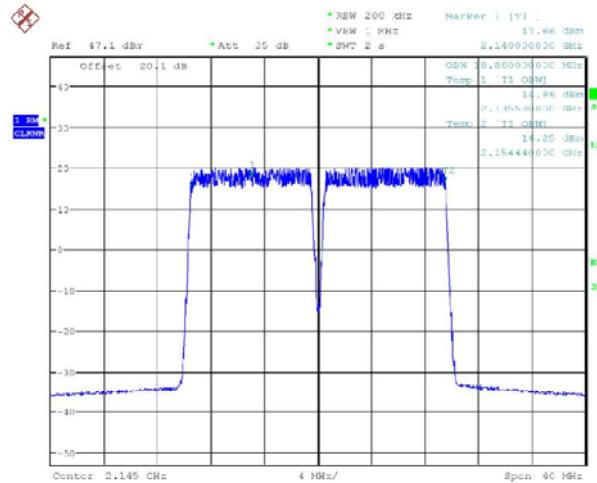
FCC ID:
VBNAHIB-Test Report No:
D556049976**Figure 43 Occupied Bandwidth – 64QAM (2145.0 MHz) (20MHz Channel BW)****Figure 44 Occupied Bandwidth – 256QAM (2145.0 MHz) (20MHz Channel BW)**



Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976**Config C ANT1:**

Date: 28.APR.2017 10:50:25

Figure 45 Occupied Bandwidth – QPSK (2140/2150 MHz) (10+10MHz Channel BW)

Date: 2.MAY.2017 09:03:02

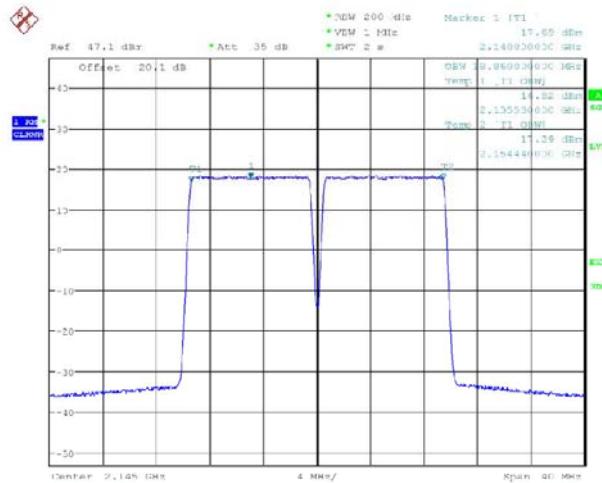
Figure 46 Occupied Bandwidth – 16QAM (2140/2150 MHz) (10+10MHz channel BW)FCC 47 CFR part 27
(2016)

16. May 2017

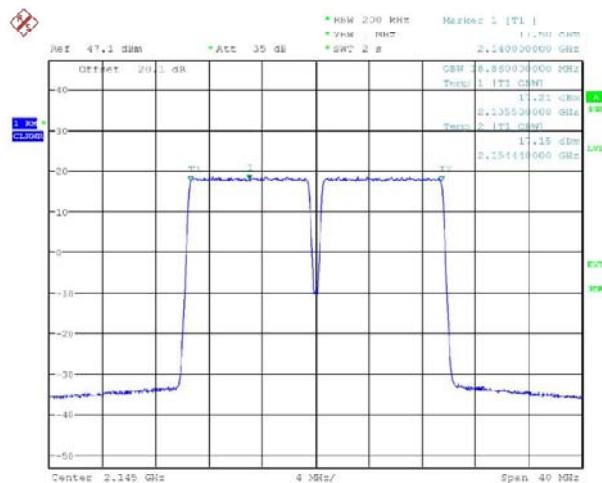
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Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976

Date: 2.MAY.2017 09:09:48

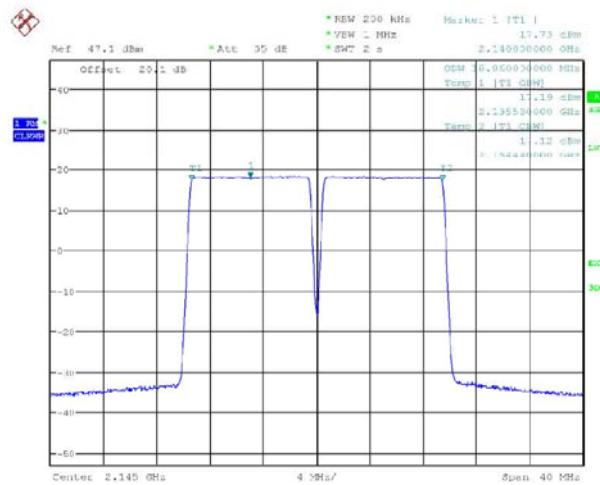
Figure 47 Occupied Bandwidth – 64QAM (2140/2150 MHz) (10+10MHz Channel BW)

Date: 2.MAY.2017 10:03:05

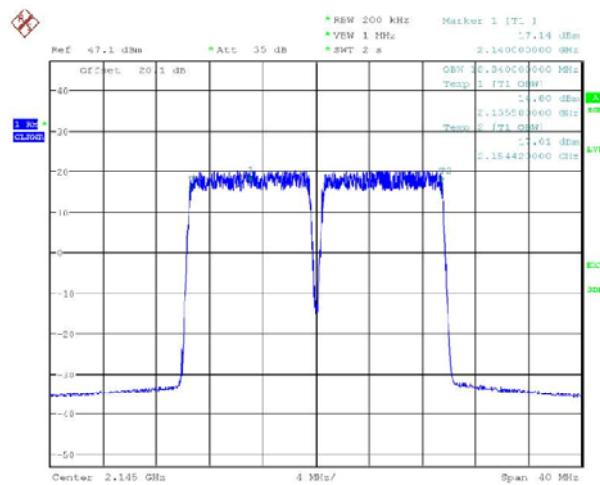
Figure 48 Occupied Bandwidth – 256QAM (2140/2150 MHz) (10+10MHz Channel BW)



Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976**Config C ANT2:**

Date: 2.MAY.2017 11:43:06

Figure 49 Occupied Bandwidth – QPSK (2140/2150 MHz) (10+10MHz Channel BW)

Date: 2.MAY.2017 12:24:16

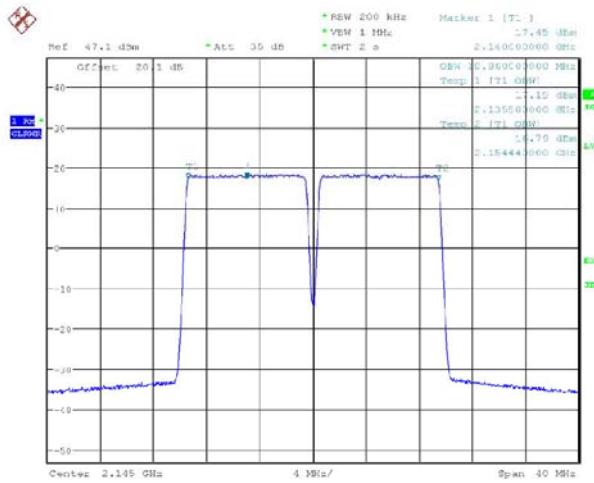
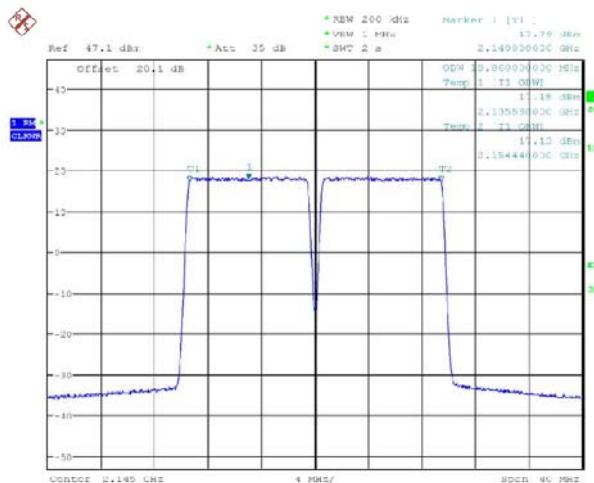
Figure 50 Occupied Bandwidth – 16QAM (2140/2150 MHz) (10+10MHz channel BW)FCC 47 CFR part 27
(2016)

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Product Service

FCC ID:
VBNAHIB-Test Report No:
D556049976**Figure 51 Occupied Bandwidth – 64QAM (2140/2150 MHz) (10+10MHz Channel BW)****Figure 52 Occupied Bandwidth – 256QAM (2140/2150 MHz) (10+10MHz Channel BW)**

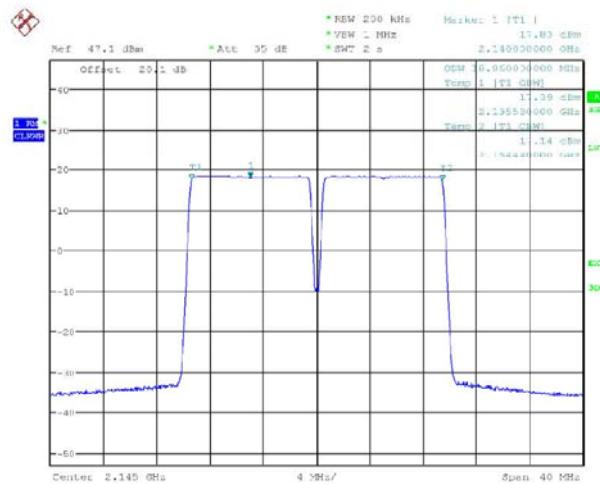


Product Service

FCC ID:
VBNAHIB-

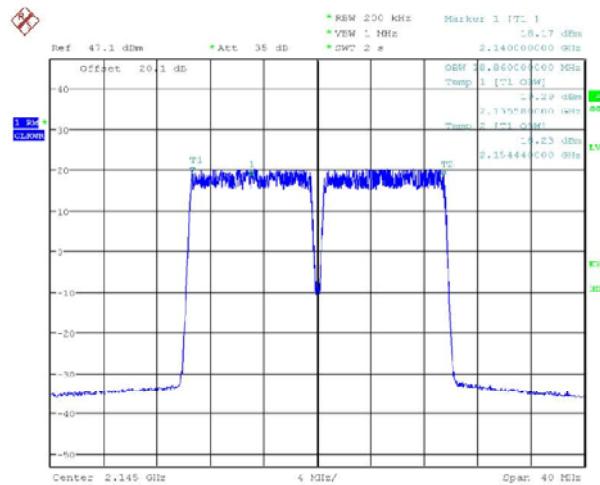
Test Report No:
D556049976

Config C ANT3:



Dated: 2.MAY.2017 13:34:07

Figure 53 Occupied Bandwidth – QPSK (2140/2150 MHz) (10+10MHz Channel BW)



Date: 2.MAY.2017 13:51:13

Figure 54 Occupied channel BW

16. May 2017

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