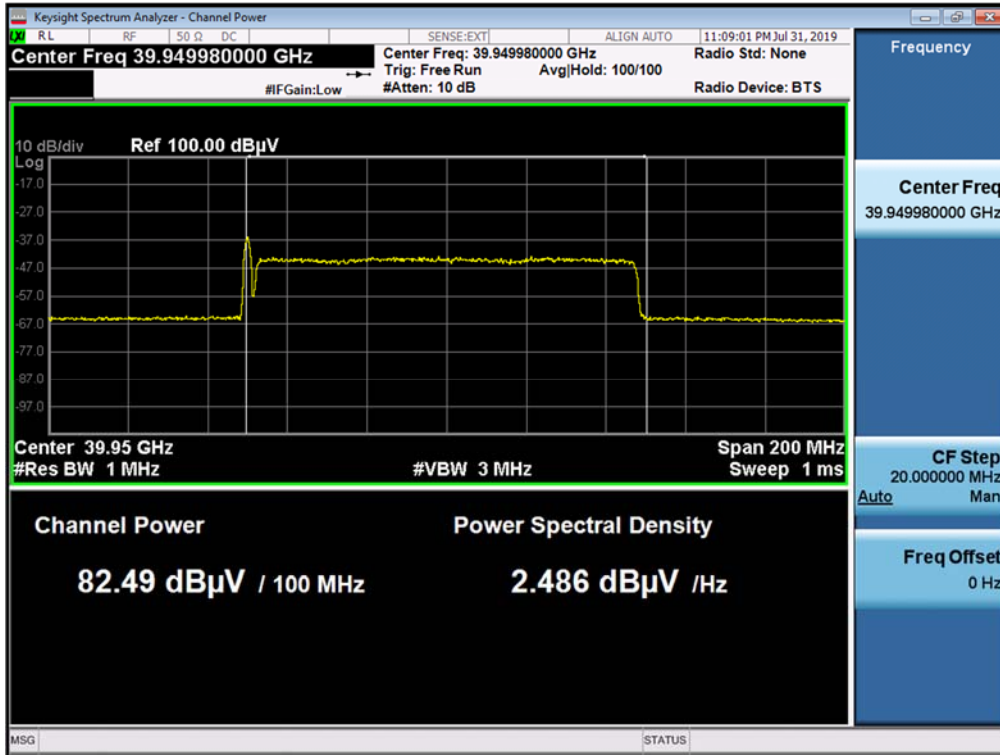
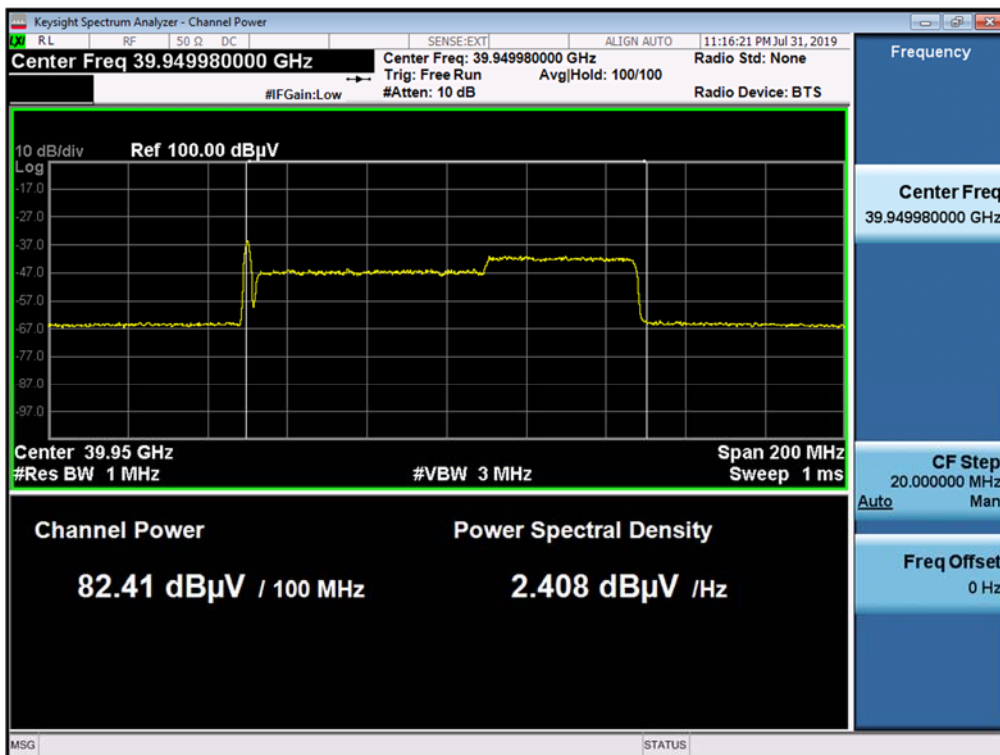
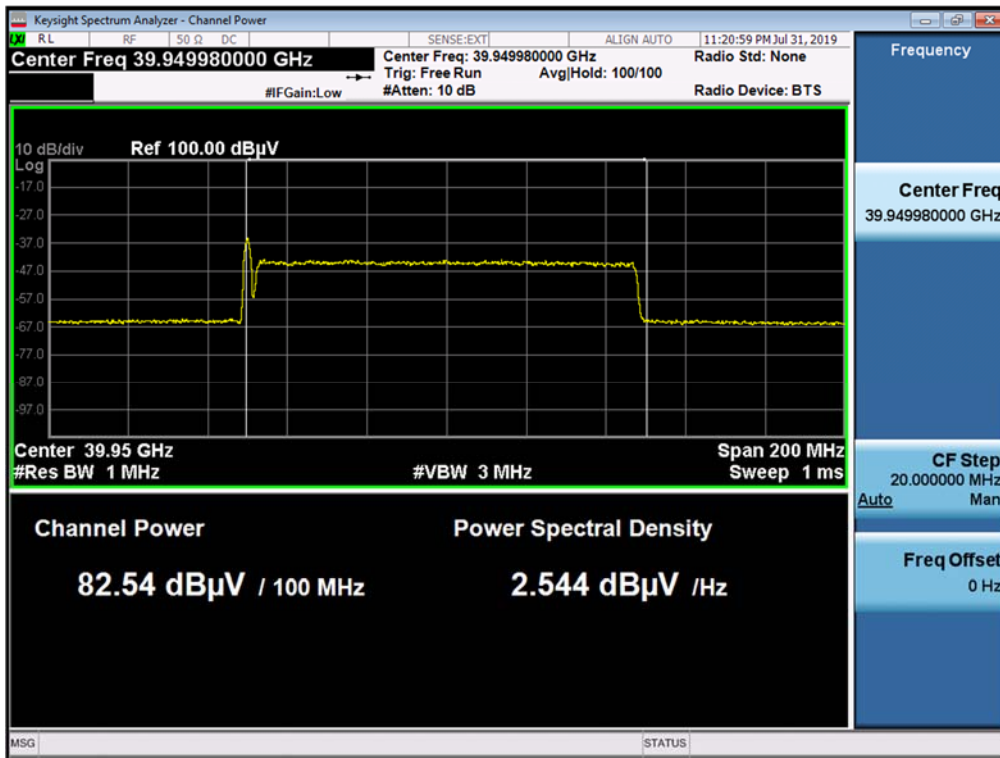
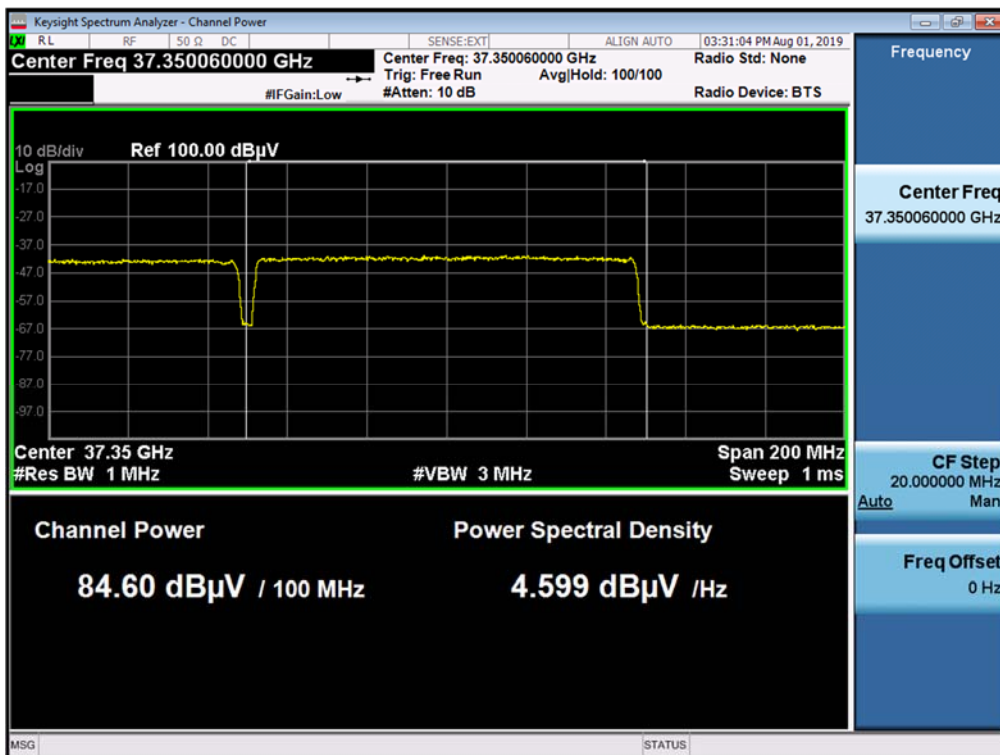


Antenna B / 1cc / QPSK / High

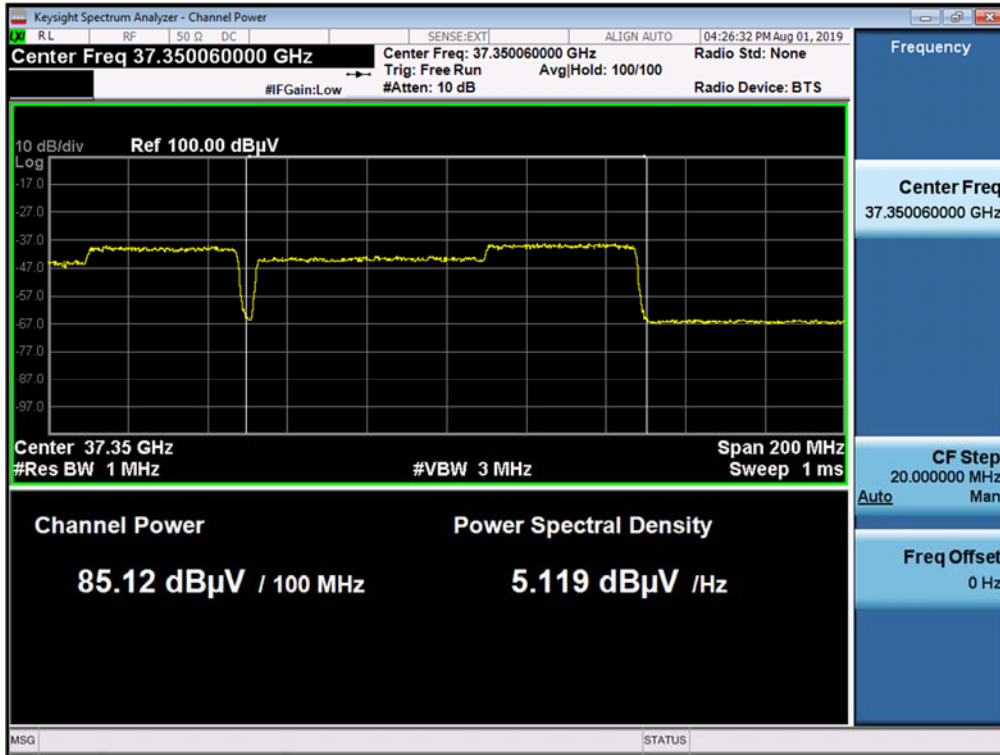


Antenna B / 1cc / 16QAM / High

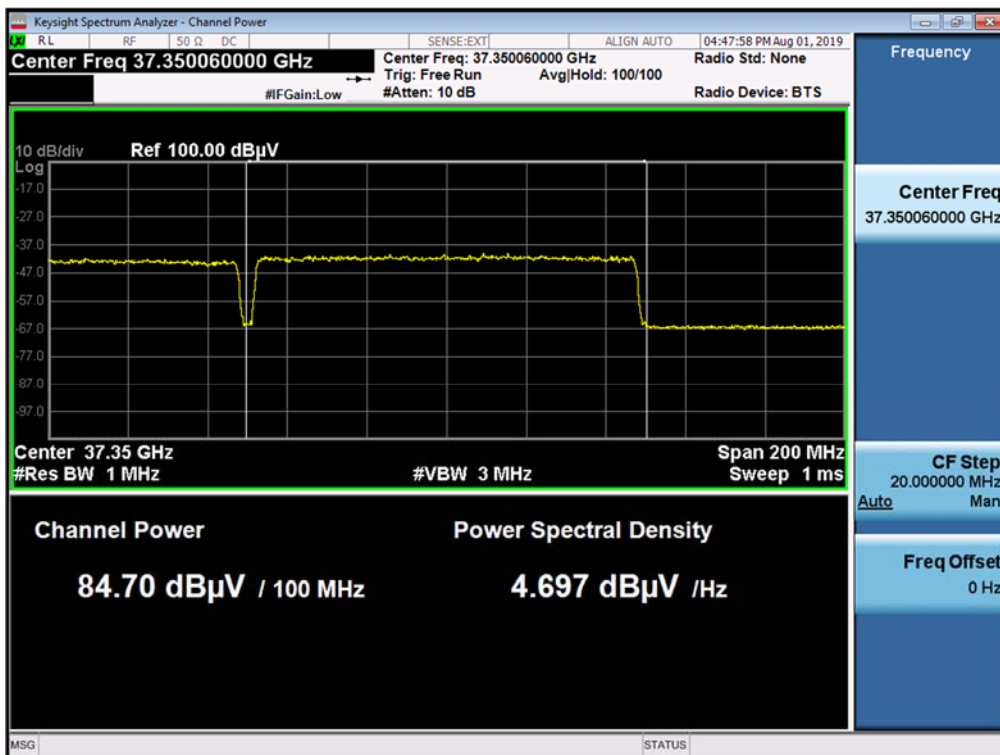


Antenna B / 1cc / 64QAM / High

Antenna B / 4cc / QPSK / Low


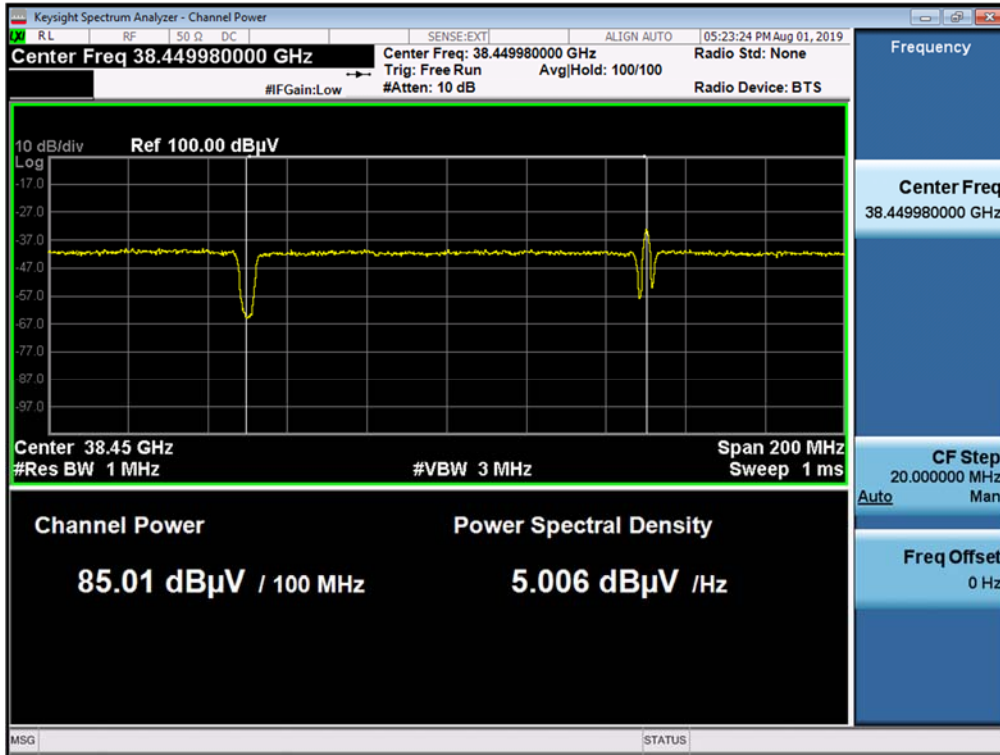
Antenna B / 4cc / 16QAM / Low



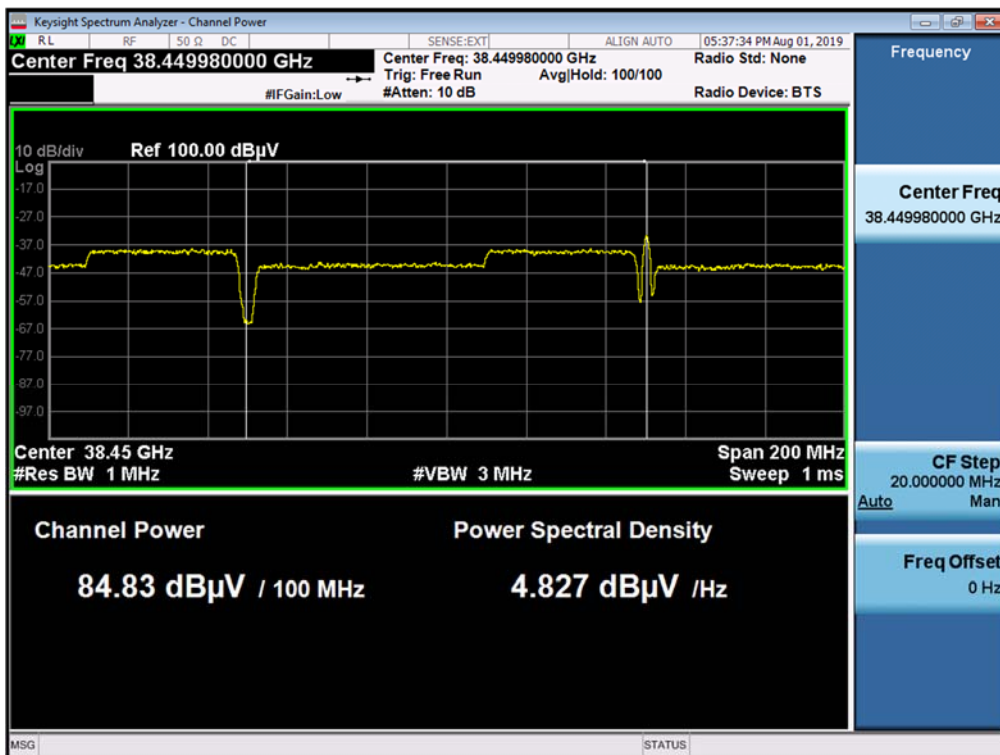
Antenna B / 4cc / 64QAM / Low



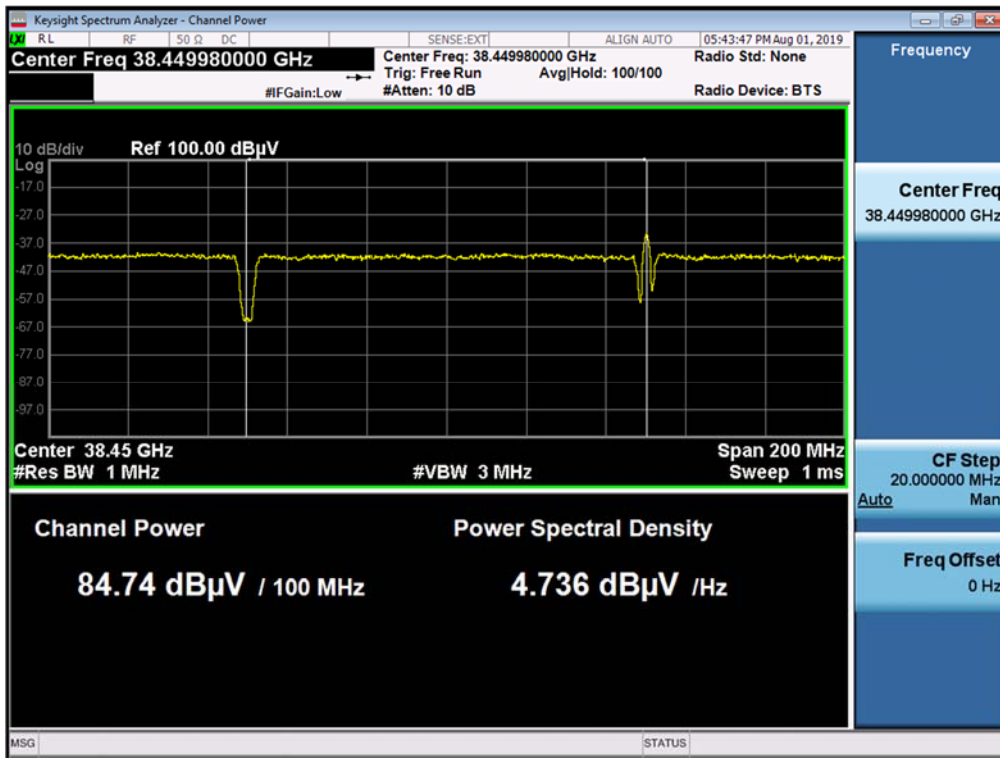
Antenna B / 4cc / QPSK / Middle



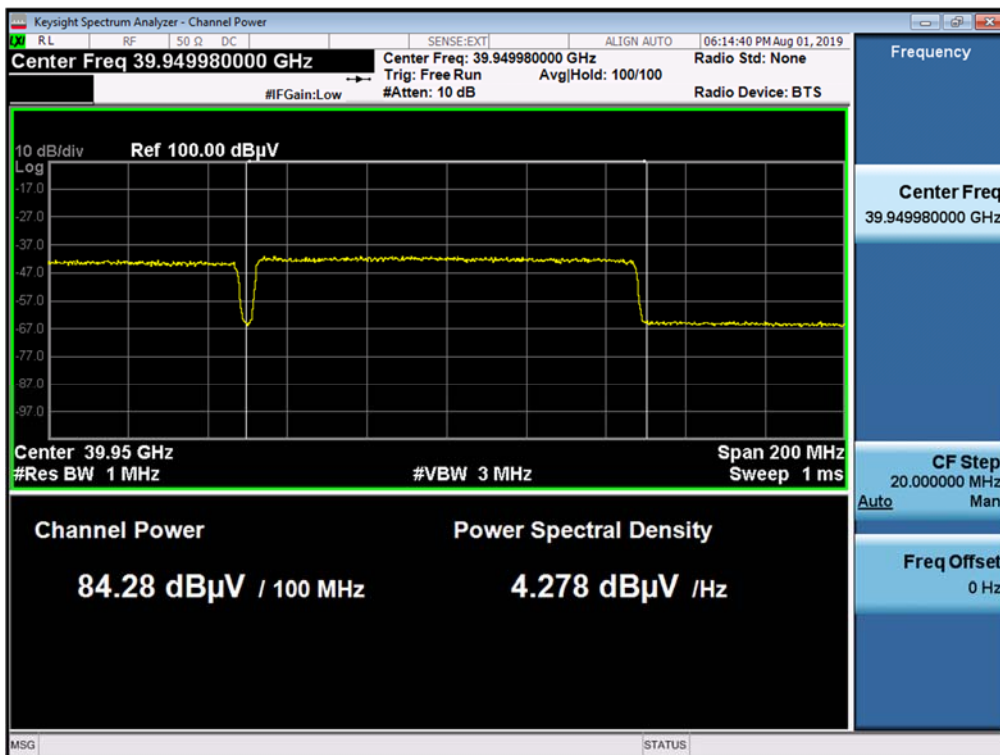
Antenna B / 4cc / 16QAM / Middle

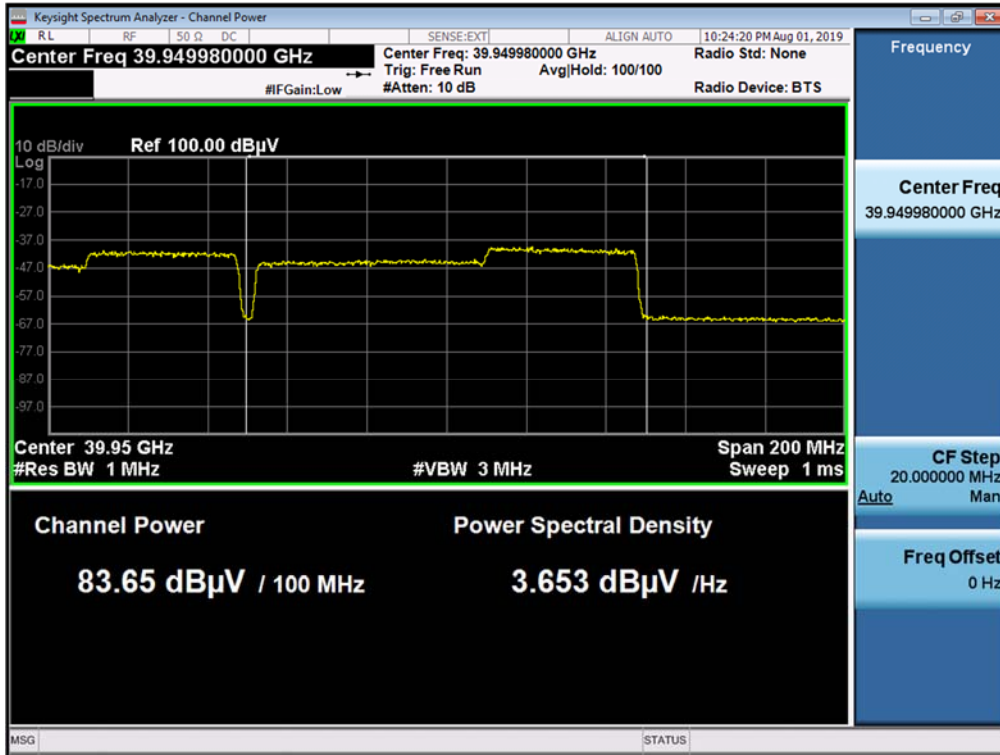
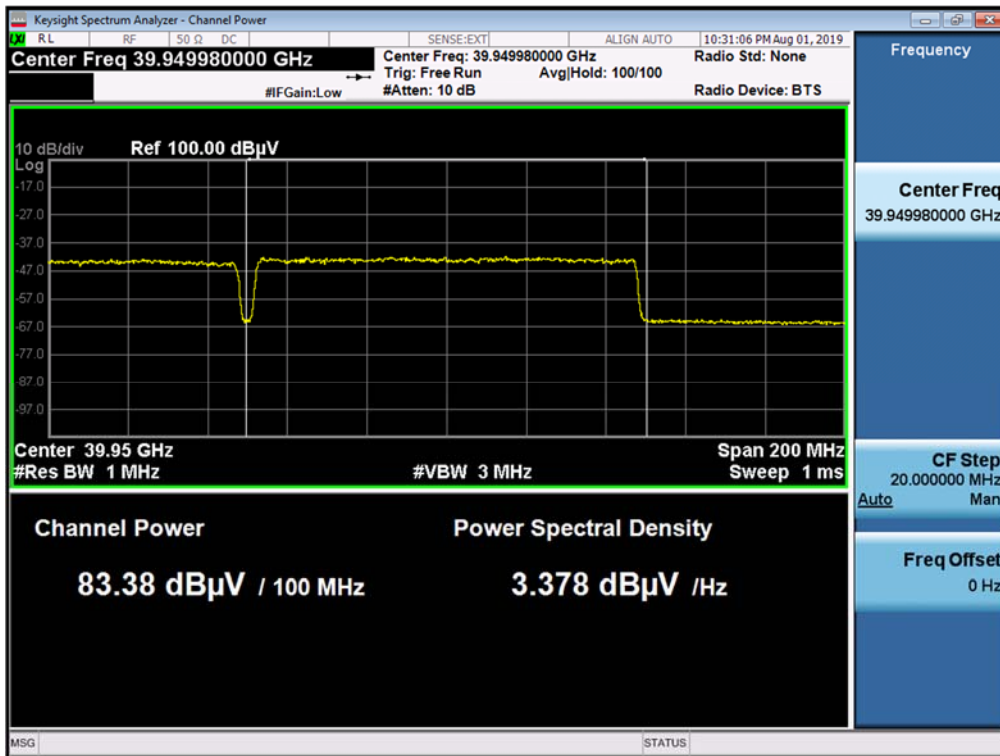


Antenna B / 4cc / 64QAM / Middle



Antenna B / 4cc / QPSK / High



Antenna B / 4cc / 16QAM / High

Antenna B / 4cc / 64QAM / High


5.3. CONDUCTED OUTPUT POWER

FCC Rules

Test Requirements:

§ 2.1046 Measurements required: RF power output.

- (a) For transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in §2.1033(c)(8). The electrical characteristics of the radio frequency load attached to the output terminals when this test is made shall be stated.
- (b) For single sideband, independent sideband, and single channel, controlled carrier radiotelephone transmitters the procedure specified in paragraph (a) of this section shall be employed and, in addition, the transmitter shall be modulated during the test as specified and applicable in § 2.1046 (b) (1-5). In all tests, the input level of the modulating signal shall be such as to develop rated peak envelope power or carrier power, as appropriate, for the transmitter.
- (c) For measurements conducted pursuant to paragraphs (a) and (b) of this section, all calculations and methods used by the applicant for determining carrier power or peak envelope power, as appropriate, on the basis of measured power in the radio frequency load attached to the transmitter output terminals shall be shown. Under the test conditions specified, no components of the emission spectrum shall exceed the limits specified in the applicable rule parts as necessary for meeting occupied bandwidth or emission limitations.

Test Procedures:

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

- a) Set span to $2 \times$ to $3 \times$ the OBW.
- b) Set RBW = 1% to 5% of the OBW.
- c) Set VBW $\geq 3 \times$ RBW.
- d) Set number of measurement points in sweep $\geq 2 \times$ span / RBW.
- e) Sweep time:
 - 1) Set = auto-couple, or
 - 2) Set $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission symbol period})]$ for single sweep (automation-compatible) measurement.
- f) Detector = power averaging (rms).
- g) Set sweep trigger to "free run."
- h) Trace average at least 100 traces in power averaging (rms) mode if sweep is set to auto-couple. To accurately determine the average power over the on and off time of the transmitter, it can be necessary to increase the number of traces to be averaged above 100, or if using a manually configured sweep time, increase the sweep time.
- i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function with band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
- j) Add $10 \log (1/\text{duty cycle})$ to the measured power level to compute the average power during continuous transmission.

Note:

- 1) Basic test conditions are same as EIRP test on page 24.
- 2) Same 400 MHz bandwidth applies for 1cc and 4 cc.
- 3) Final conducted power is calculated as follows

$$\text{Conducted Power (dBm)} = \text{EIRP (dBm)} - \text{Antenna Gain (dBi)}$$

- 4) Antenna Gain of the above formula was applied from actual measurement data of the radiation pattern document.
- 5) Sample calculation

Antenna A, 1cc, Low, QPSK:

$$\begin{aligned} 82.25 \text{ dB}\mu\text{V (measured)} + 11.48 \text{ (distance)} - 104.77 + 48.19 \text{ (AFCL)} + 2.214 \text{ (Duty)} - 24.80 \text{ (Ant.gain)} \\ = 14.57 \text{ dBm (Final conducted output power)} \end{aligned}$$

Total Output Power (1cc, Low, QPKS):

Conversion dBm to mW (Antenna A)

$$10^{(14.57 \text{ dBm} / 10)} = 121.34 \text{ mW}$$

Sum each antenna power

$$28.64 \text{ mW (Ant.A)} + 34.99 \text{ mW (Ant.B)} = 63.64 \text{ mW}$$

Conversion mW to dBm

$$10 \text{LOG} (64.64 \text{ mW}) = 18.03 \text{ dBm}$$

Test Results:
Tabular Data of Conducted Output Power

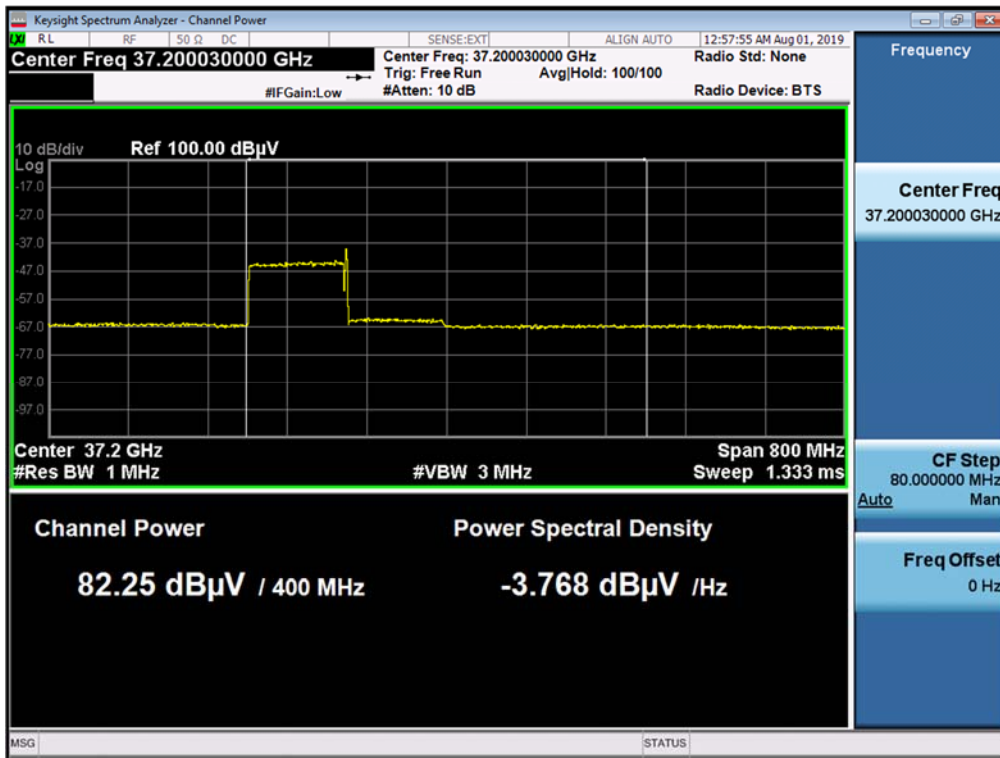
Ant.	Ant.	CC	Channel	Frequency (GHz)	Mod.	Measured Level (dBuV)	EIRP	Ant. Gain	Result		
	Angle						(dBm)	(dBi)	(dBm)		
A	135°	1	Low	37.05	QPSK	82.25	39.37	24.80	14.57		
					16QAM	82.59	39.71		14.91		
					64QAM	82.84	39.96		15.16		
			Middle	38.49996	QPSK	83.36	40.62	24.90	15.72		
					16QAM	83.46	40.72		15.82		
					64QAM	83.30	40.56		15.66		
			High	39.94998	QPSK	81.67	41.95	24.90	17.05		
					16QAM	81.27	41.54		16.64		
					64QAM	81.85	42.13		17.23		
		4	Low	37.20003	QPSK	89.07	46.18	24.80	21.38		
					16QAM	88.97	46.09		21.29		
					64QAM	88.97	46.08		21.28		
			Middle	38.49999	QPSK	89.47	46.72	24.90	21.82		
					16QAM	89.45	46.70		21.80		
					64QAM	89.54	46.79		21.89		
			High	39.79995	QPSK	87.55	47.36	24.90	22.46		
					16QAM	87.55	47.37		22.47		
					64QAM	87.69	47.51		22.61		
		B	45°	1	Low	37.05	QPSK	83.12	40.24	24.80	15.44
							16QAM	82.69	39.81		15.01
							64QAM	82.50	39.61		14.81
					Middle	38.49996	QPSK	84.67	41.93	24.90	17.03
							16QAM	85.18	42.44		17.54
							64QAM	84.96	42.21		17.31
High	39.94998				QPSK	82.18	42.45	24.90	17.55		
					16QAM	82.70	42.97		18.07		
					64QAM	82.41	42.68		17.78		
4	Low			37.20003	QPSK	88.59	45.70	24.80	20.90		
					16QAM	89.55	46.67		21.87		
					64QAM	89.57	46.69		21.89		
	Middle			38.49999	QPSK	90.74	47.99	24.90	23.09		
					16QAM	90.36	47.61		22.71		
					64QAM	90.43	47.69		22.79		
	High			39.79995	QPSK	89.40	49.22	24.90	24.32		
					16QAM	88.77	48.59		23.69		
					64QAM	88.65	48.46		23.56		

Tabular Data of Conducted Output Power

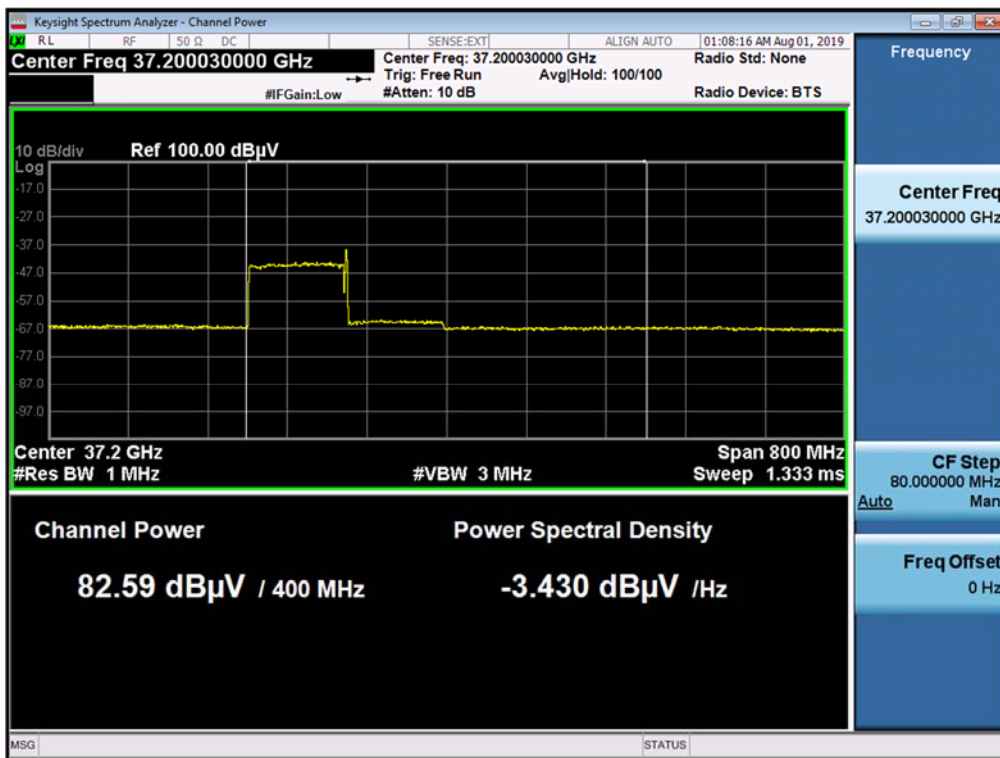
Antenna	CC	Channel	Mod.	Ant. A (dBm)	Ant. B (dBm)	Result (dBm)
A+B	1	Low	QPSK	14.57	15.44	18.03
			16QAM	14.91	15.01	17.97
			64QAM	15.16	14.81	18.00
		Middle	QPSK	15.72	17.03	19.43
			16QAM	15.82	17.54	19.77
			64QAM	15.66	17.31	19.57
		High	QPSK	17.05	17.55	20.32
			16QAM	16.64	18.07	20.43
			64QAM	17.23	17.78	20.53
	4	Low	QPSK	21.38	20.90	24.16
			16QAM	21.29	21.87	24.60
			64QAM	21.28	21.89	24.60
		Middle	QPSK	21.82	23.09	25.51
			16QAM	21.80	22.71	25.29
			64QAM	21.89	22.79	25.37
		High	QPSK	22.46	24.32	26.50
			16QAM	22.47	23.69	26.13
			64QAM	22.61	23.56	26.12

Plot Data of Conducted Output Power

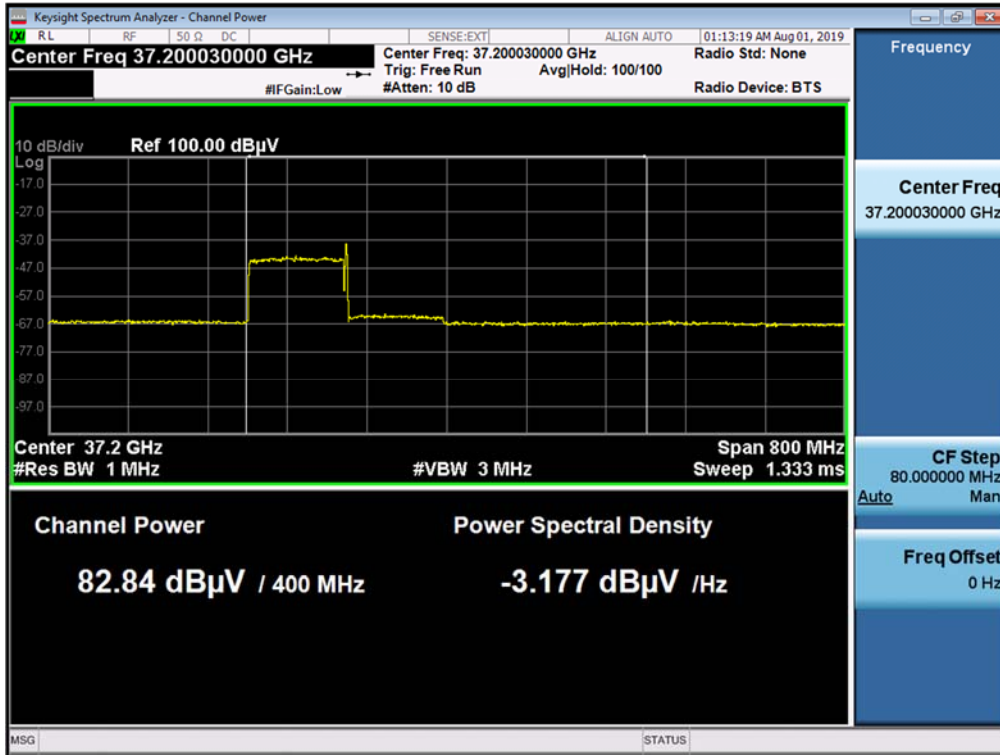
Antenna A / 1cc / QPSK / Low



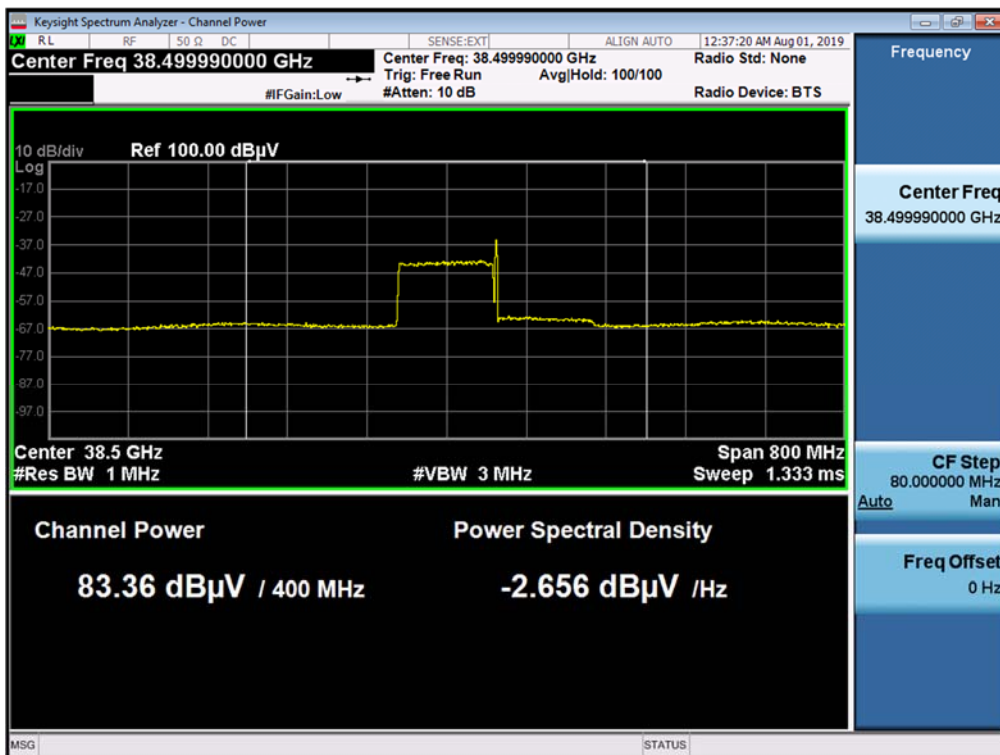
Antenna A / 1cc / 16QAM / Low



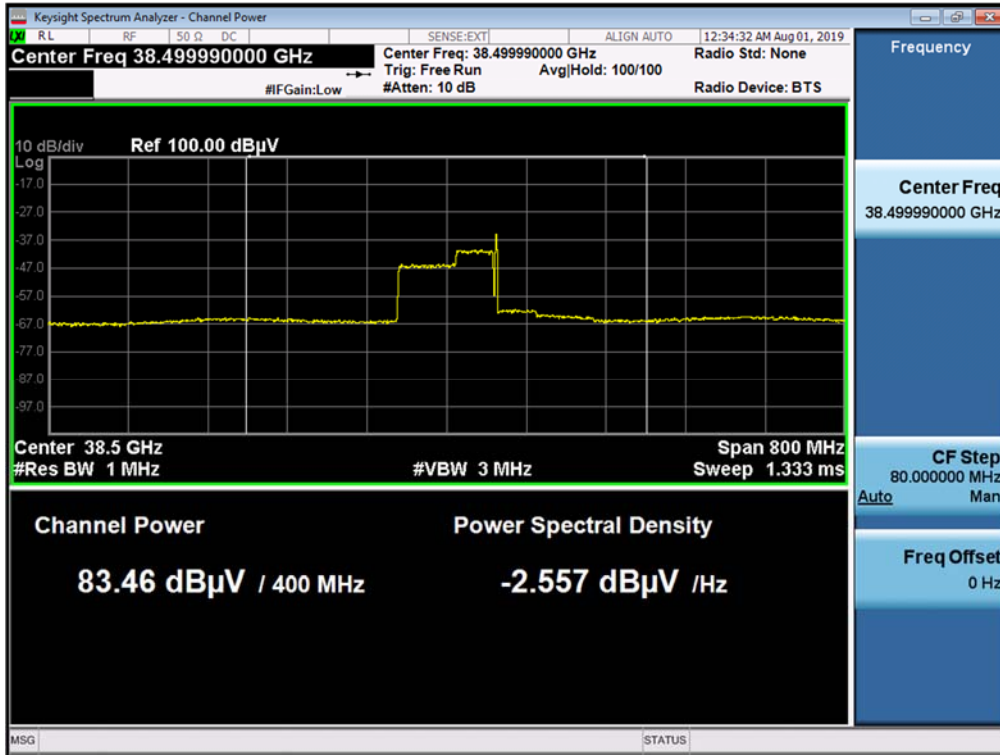
Antenna A / 1cc / 64QAM / Low



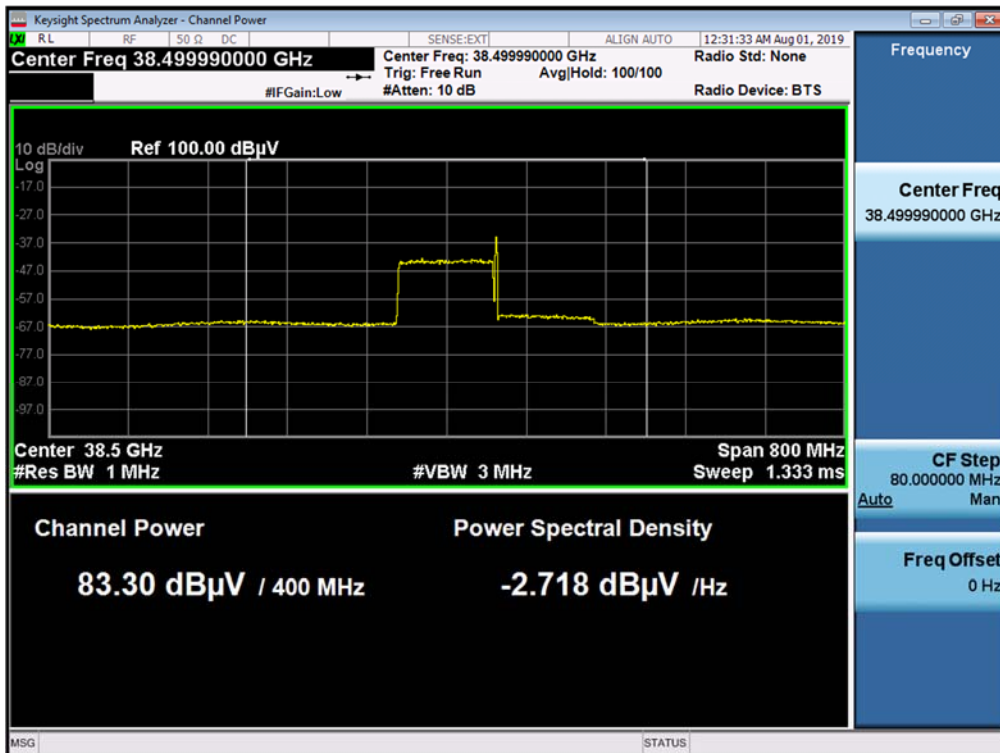
Antenna A / 1cc / QPSK / Middle



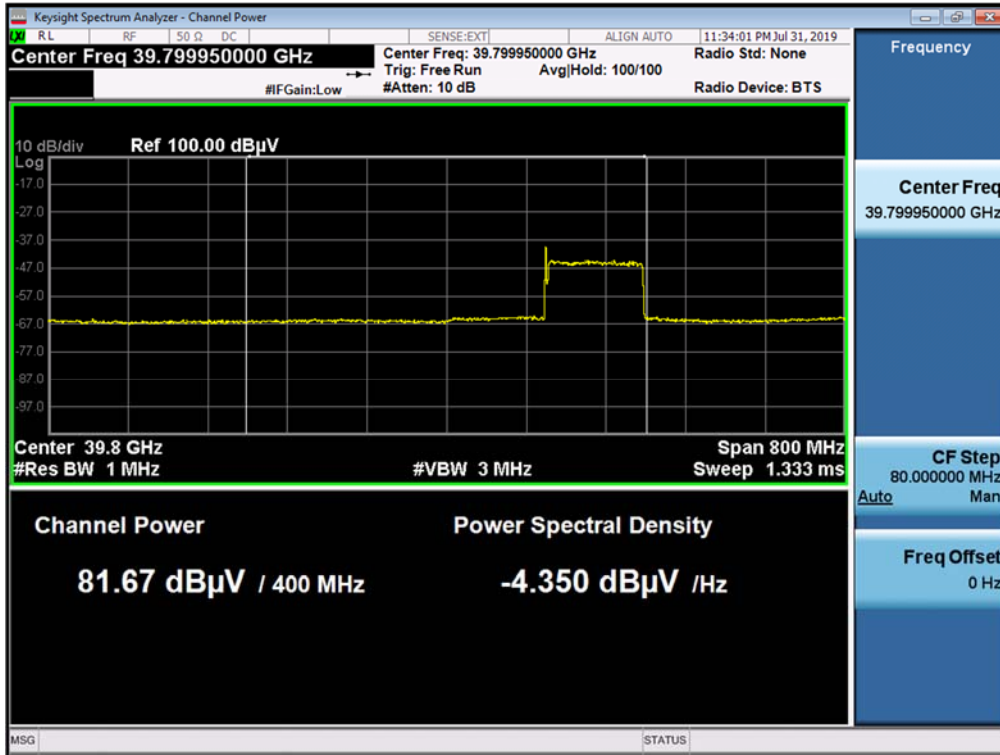
Antenna A / 1cc / 16QAM / Middle



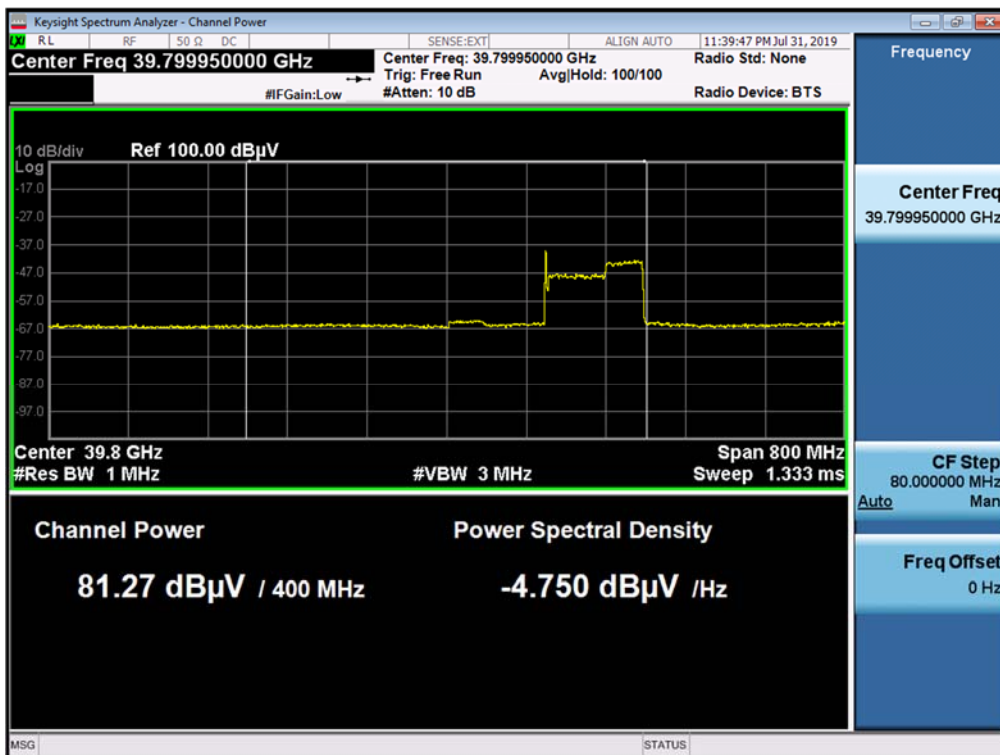
Antenna A / 1cc / 64QAM / Middle



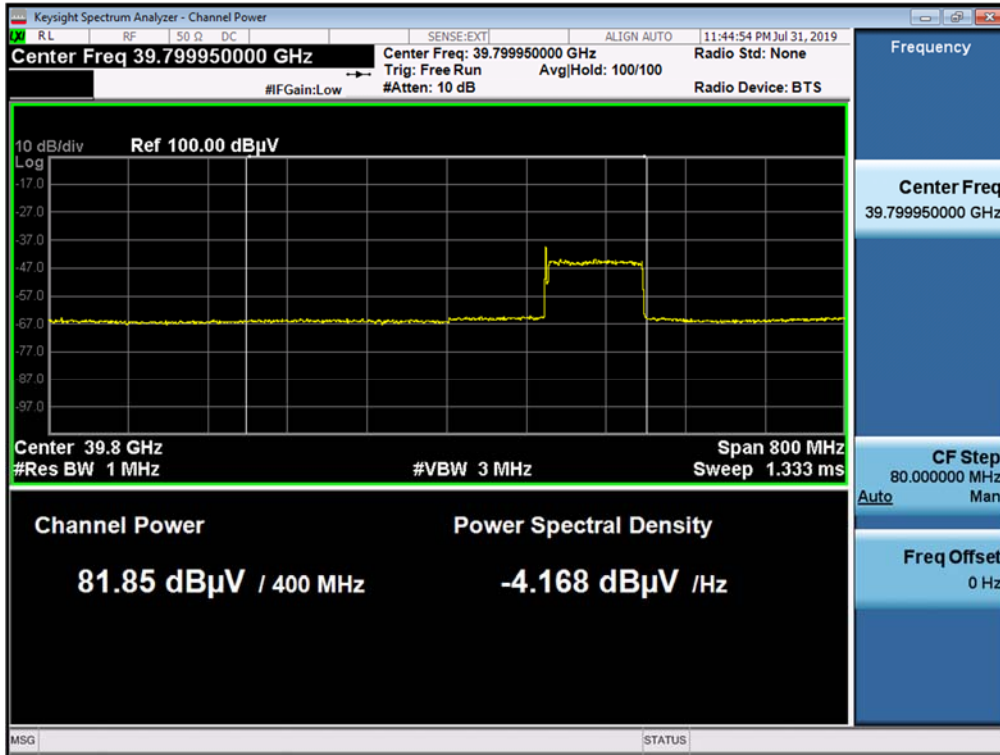
Antenna A / 1cc / QPSK / High



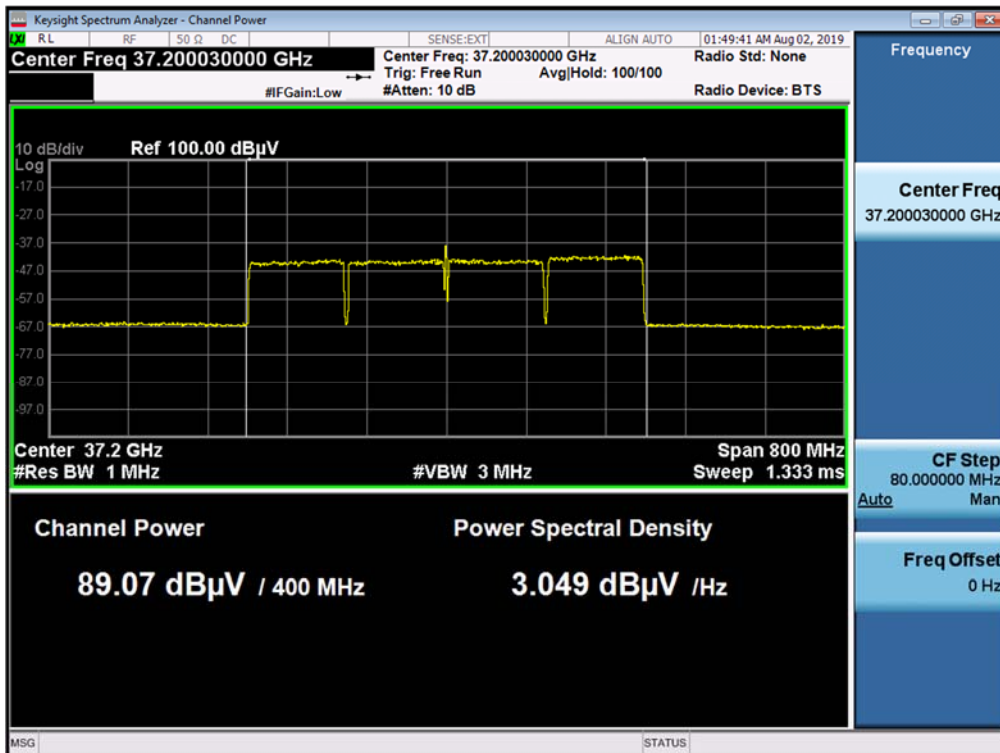
Antenna A / 1cc / 16QAM / High



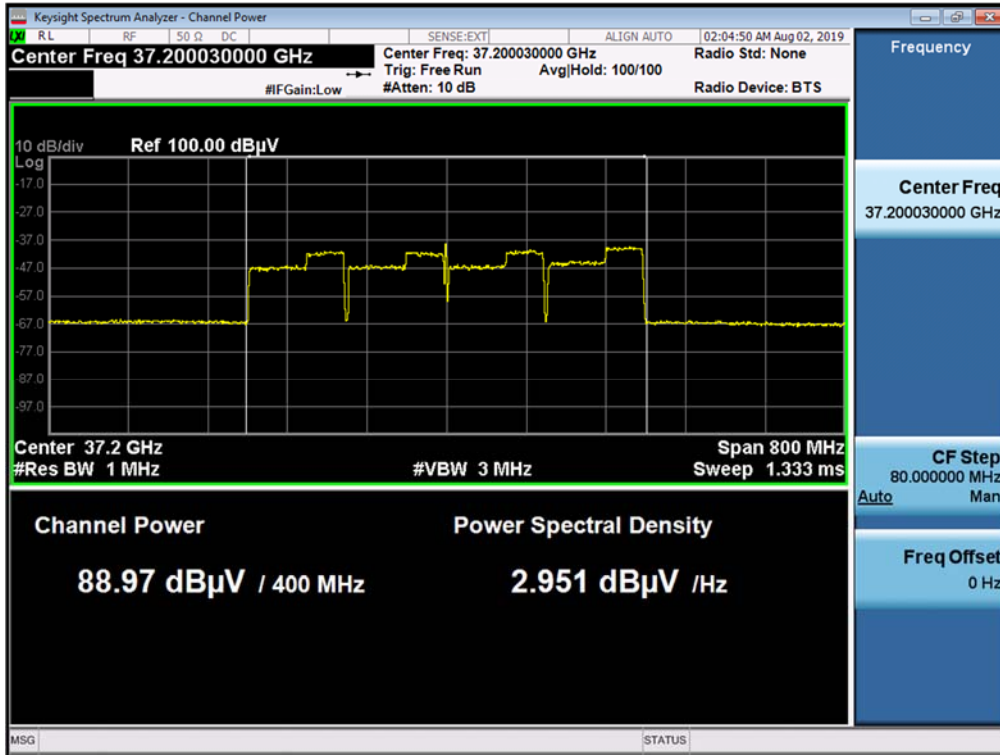
Antenna A / 1cc / 64QAM / High



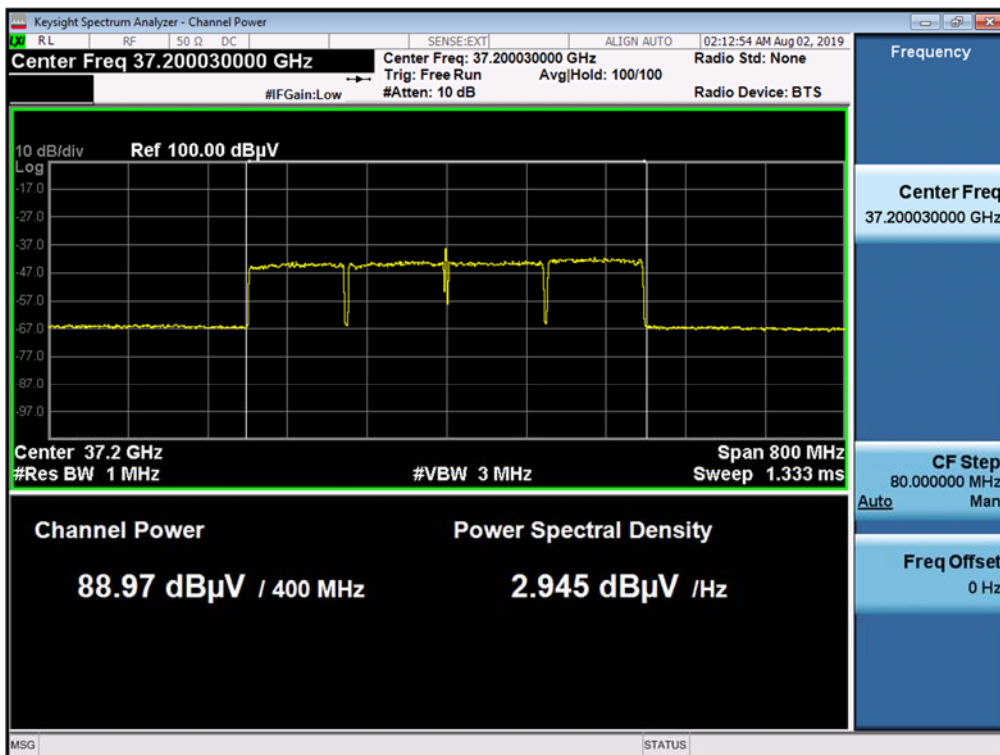
Antenna A / 4cc / QPSK / Low



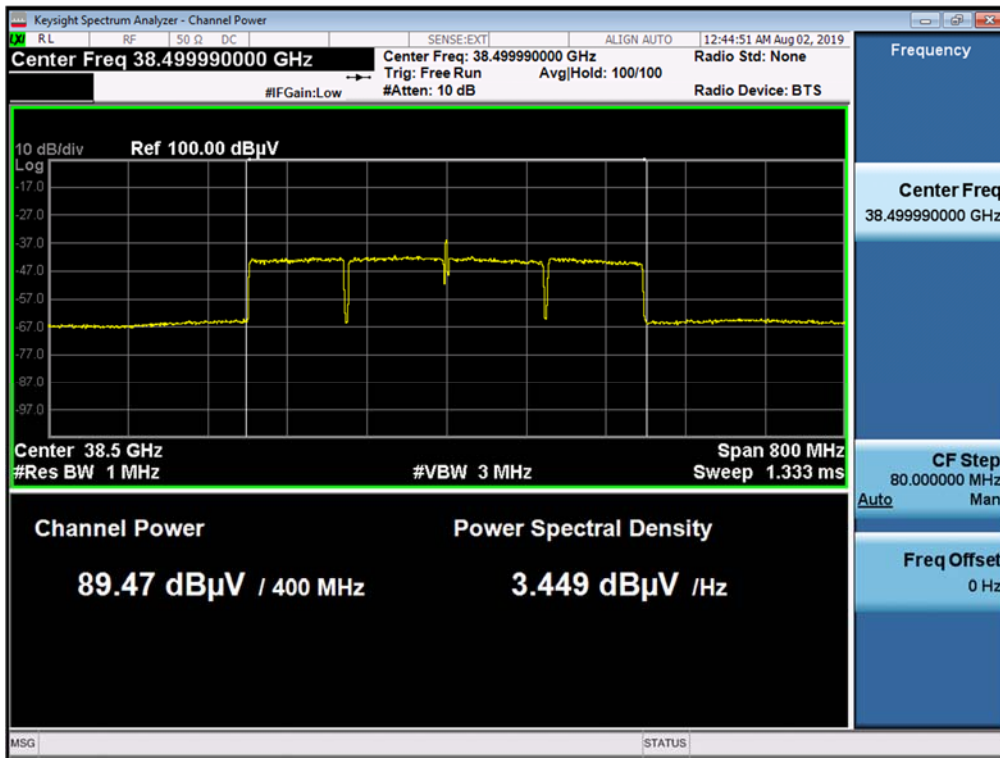
Antenna A / 4cc / 16QAM / Low



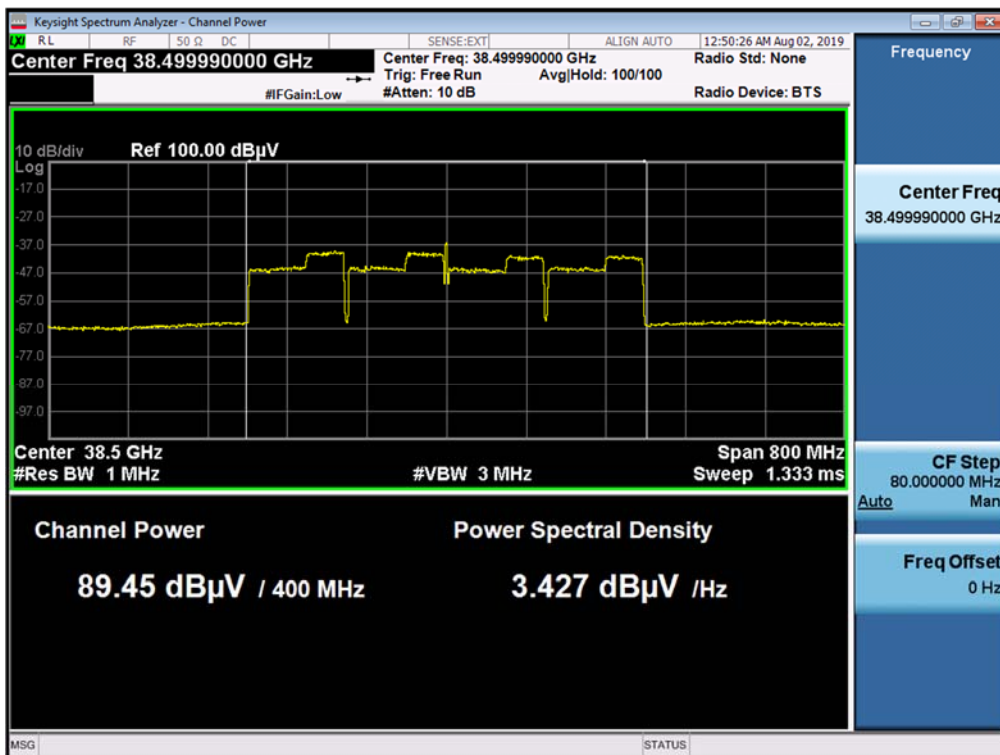
Antenna A / 4cc / 64QAM / Low



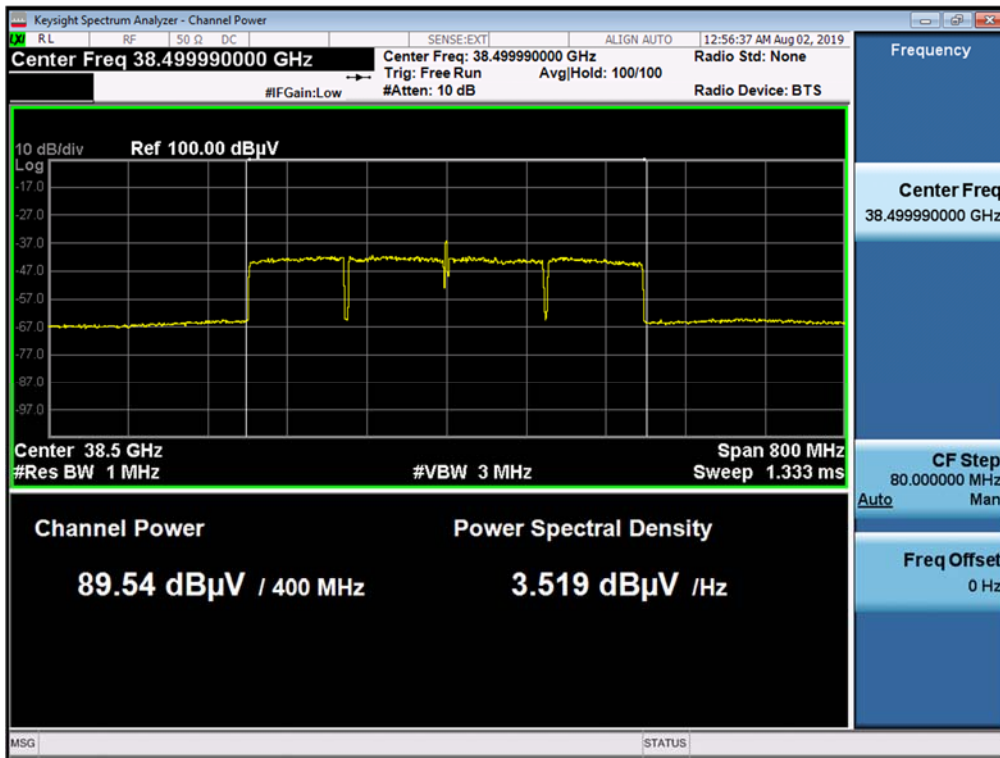
Antenna A / 4cc / QPSK / Middle



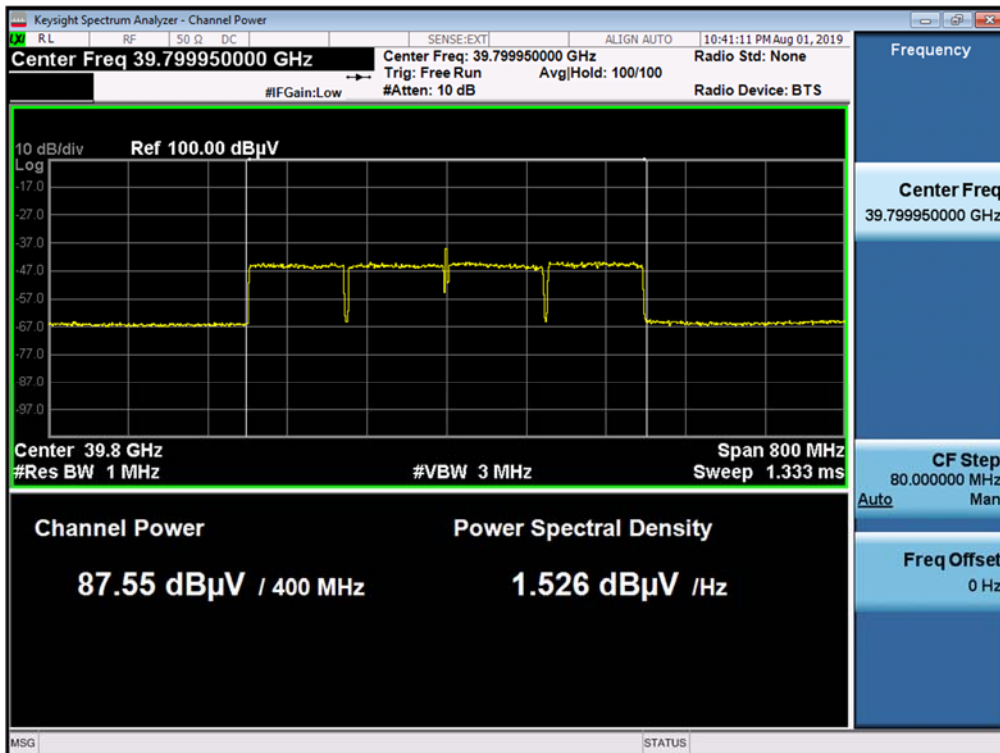
Antenna A / 4cc / 16QAM / Middle



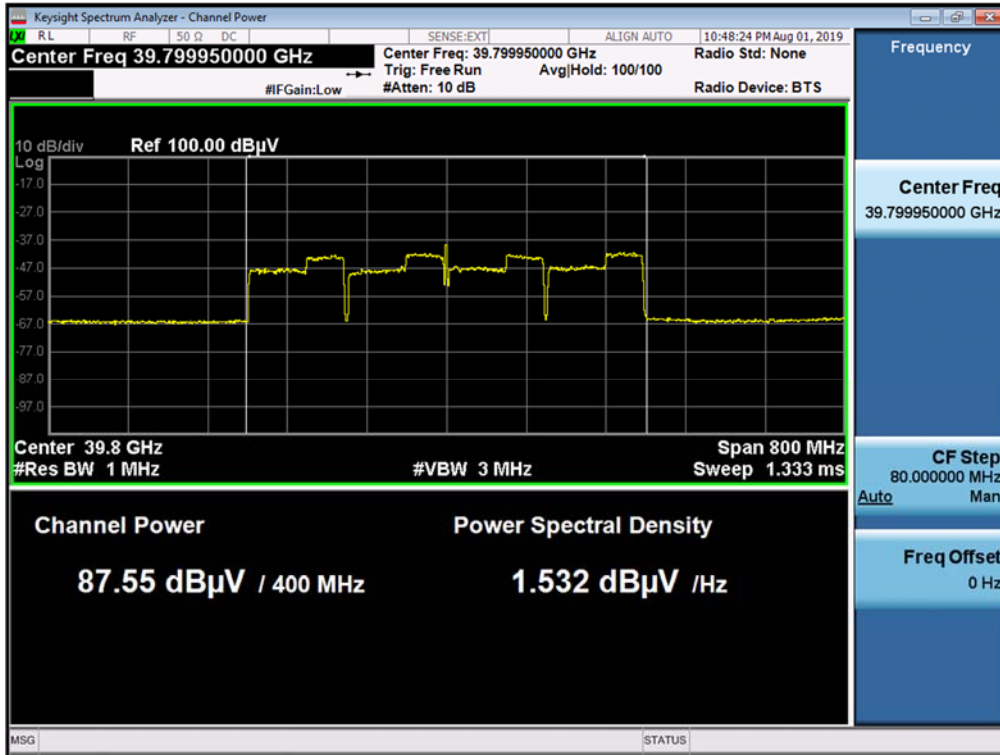
Antenna A / 4cc / 64QAM / Middle



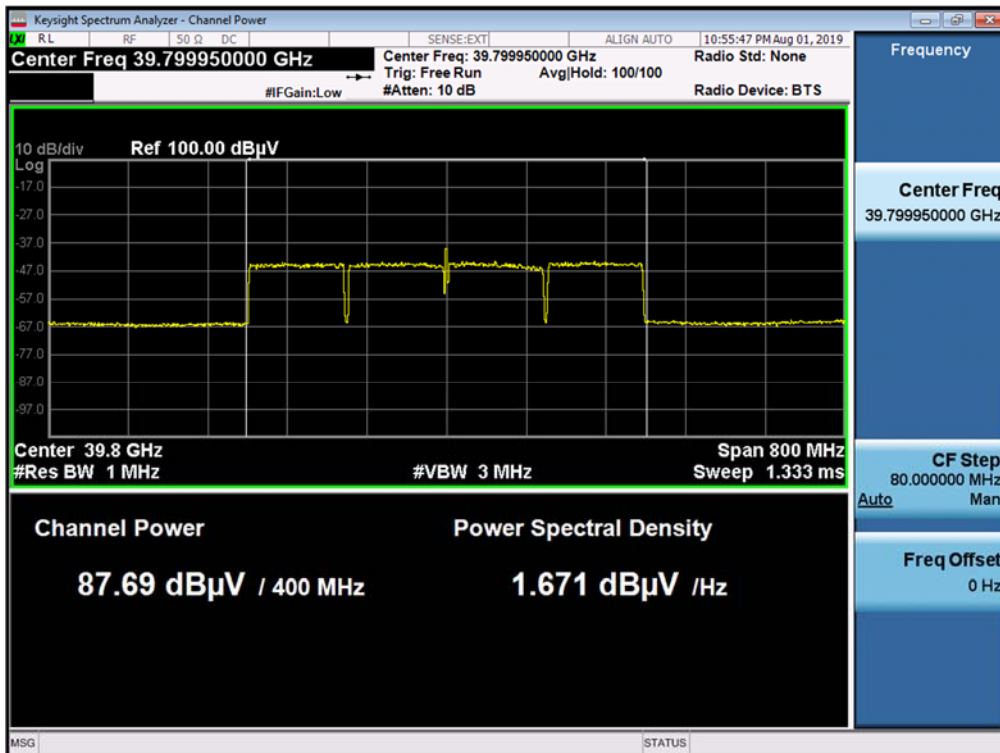
Antenna A / 4cc / QPSK / High



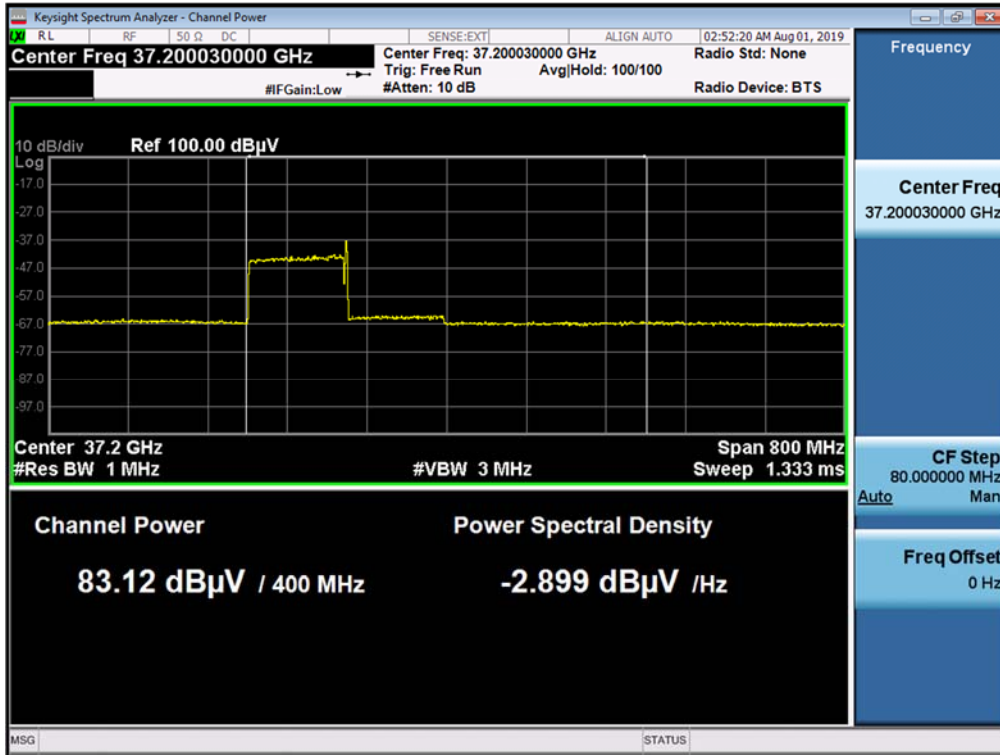
Antenna A / 4cc / 16QAM / High



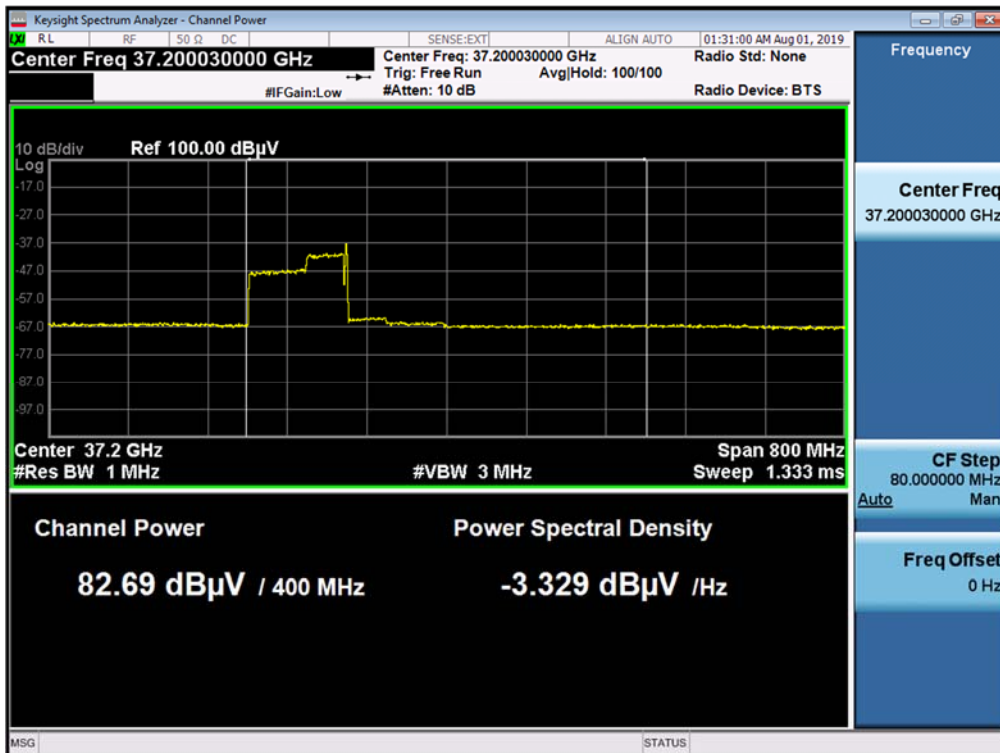
Antenna A / 4cc / 64QAM / High



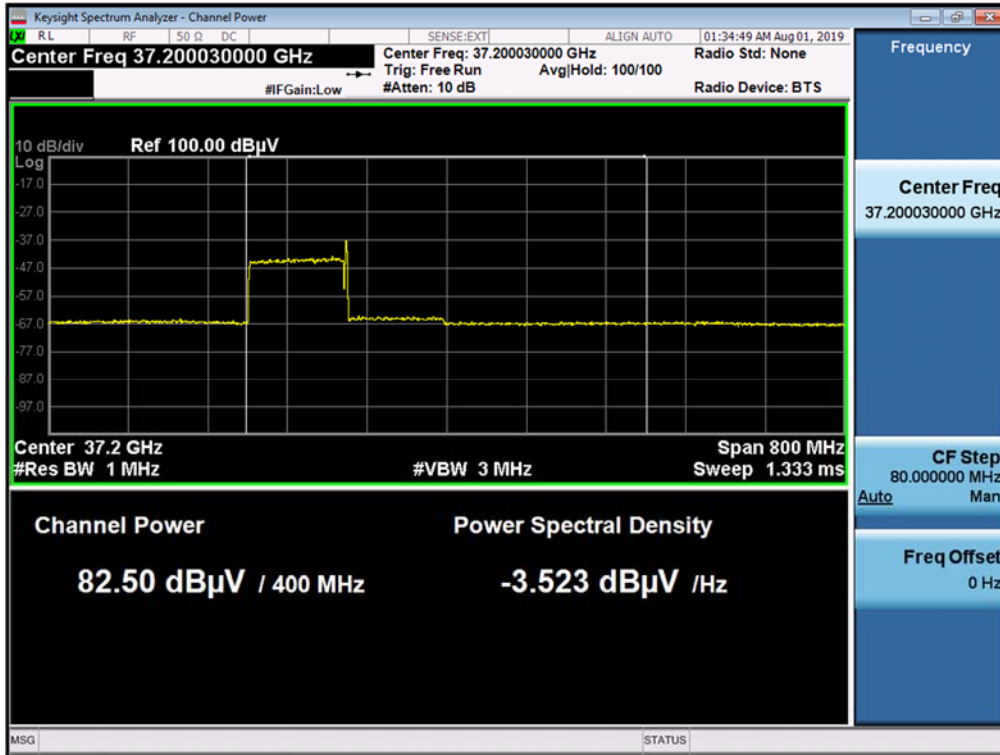
Antenna B / 1cc / QPSK / Low



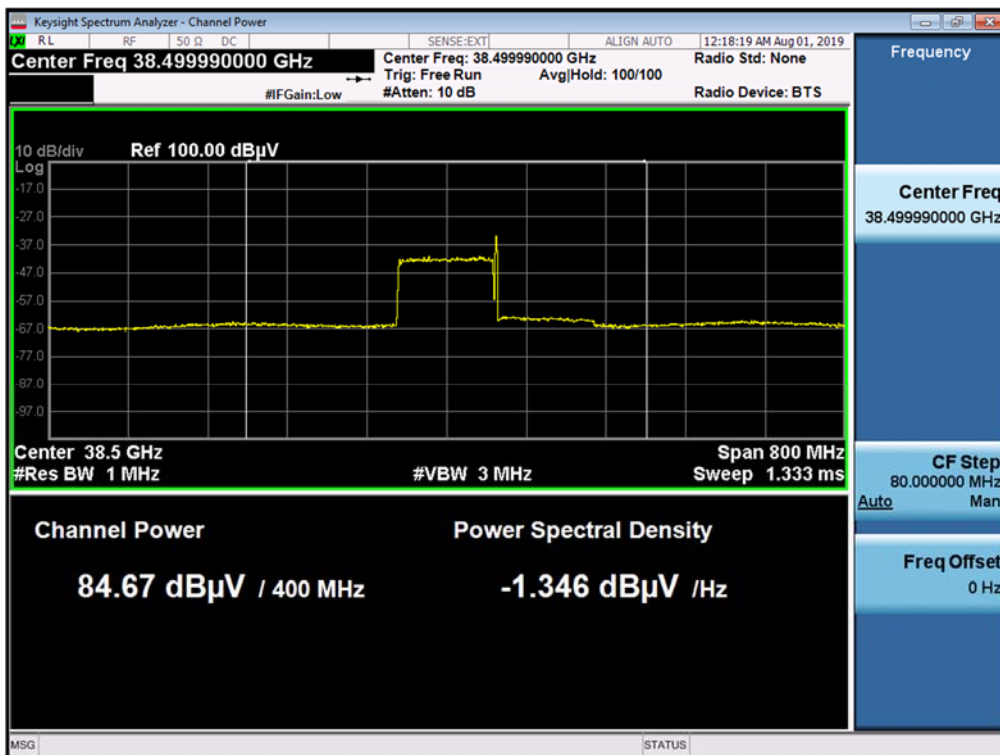
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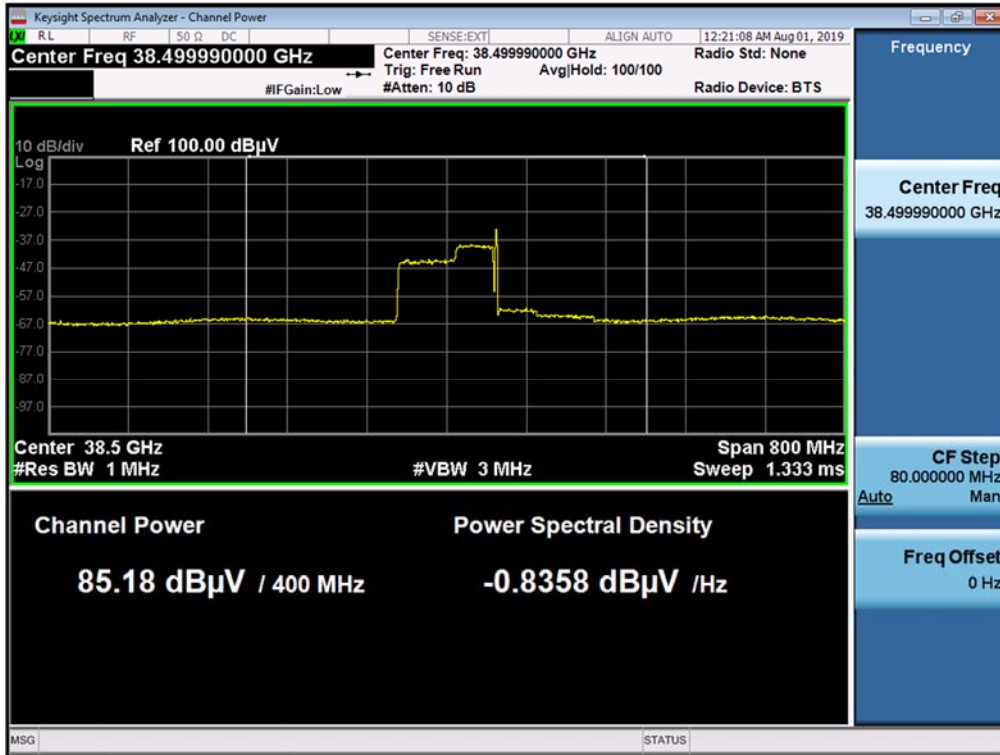
Antenna B / 1cc / 64QAM / Low



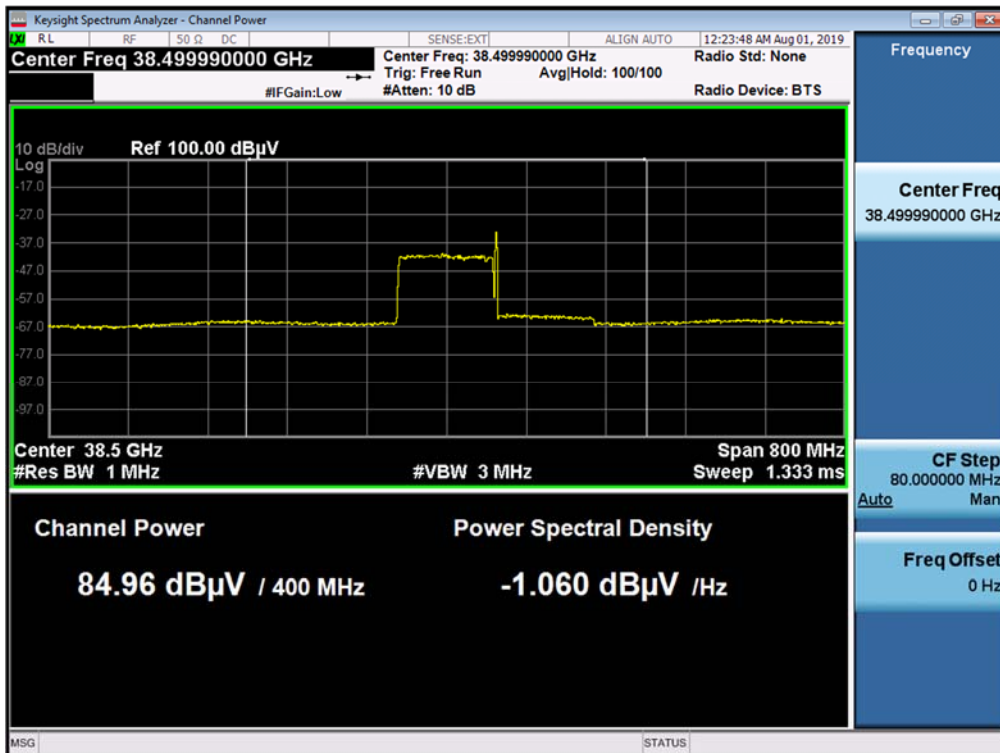
Antenna B / 1cc / QPSK / Middle



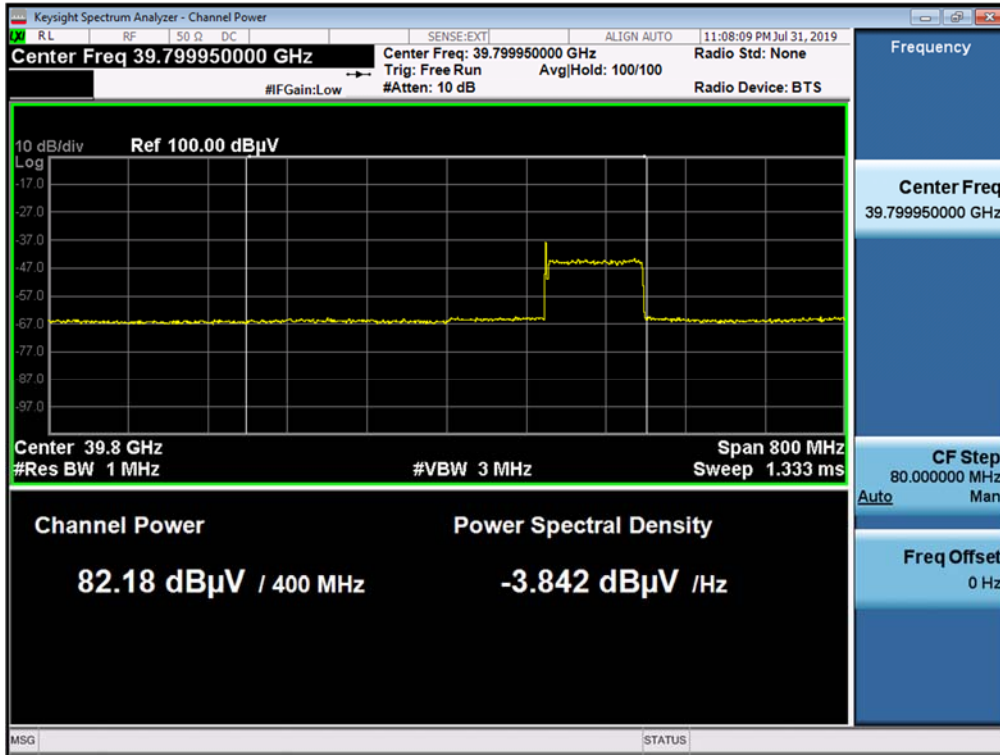
Antenna B / 1cc / 16QAM / Middle



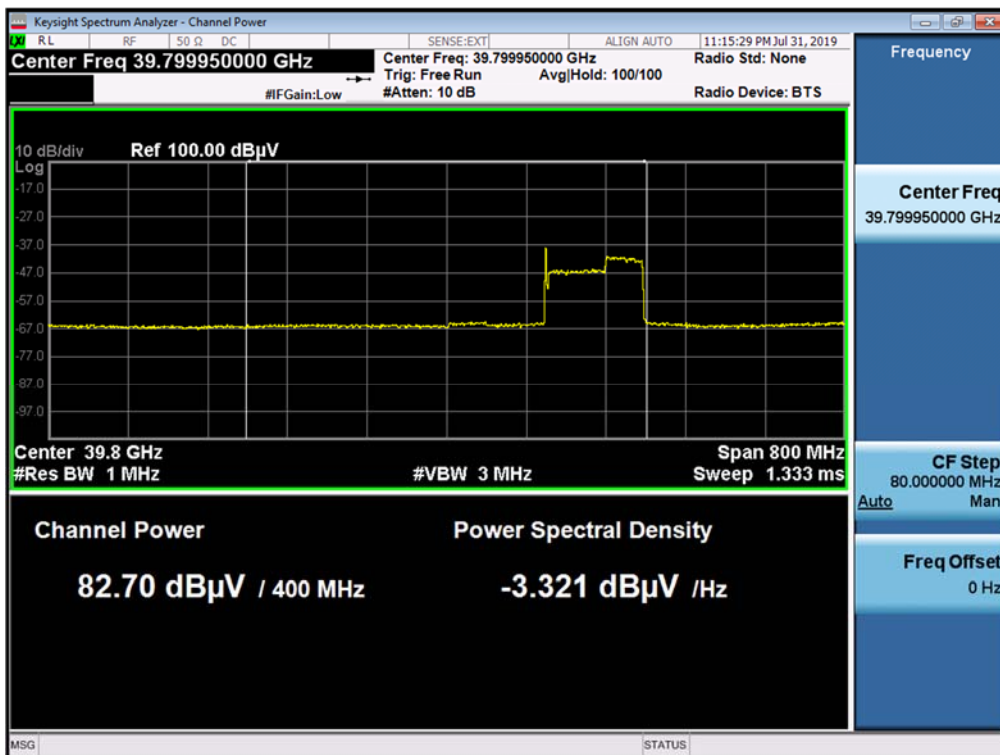
Antenna B / 1cc / 64QAM / Middle

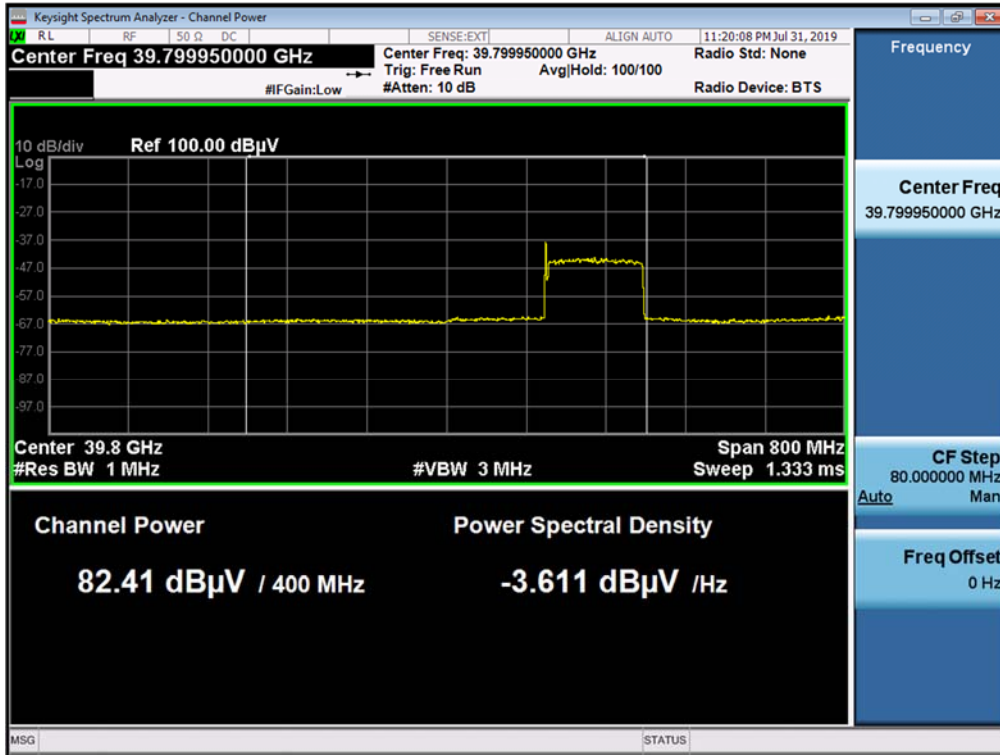


Antenna B / 1cc / QPSK / High



Antenna B / 1cc / 16QAM / High



Antenna B / 1cc / 64QAM / High

Antenna B / 4cc / QPSK / Low
