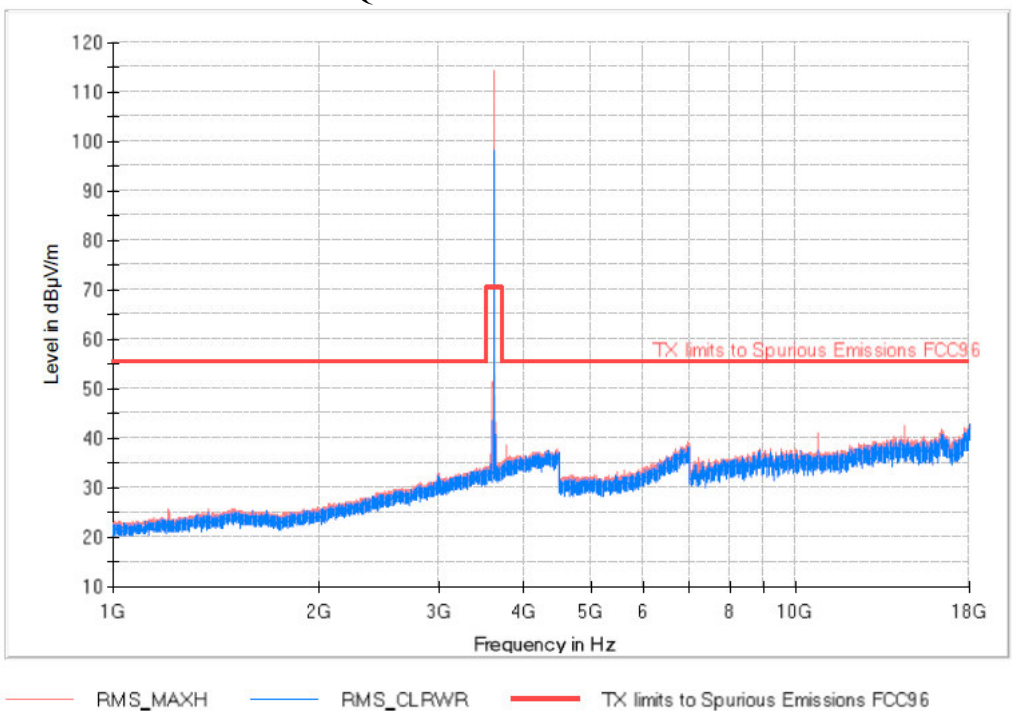
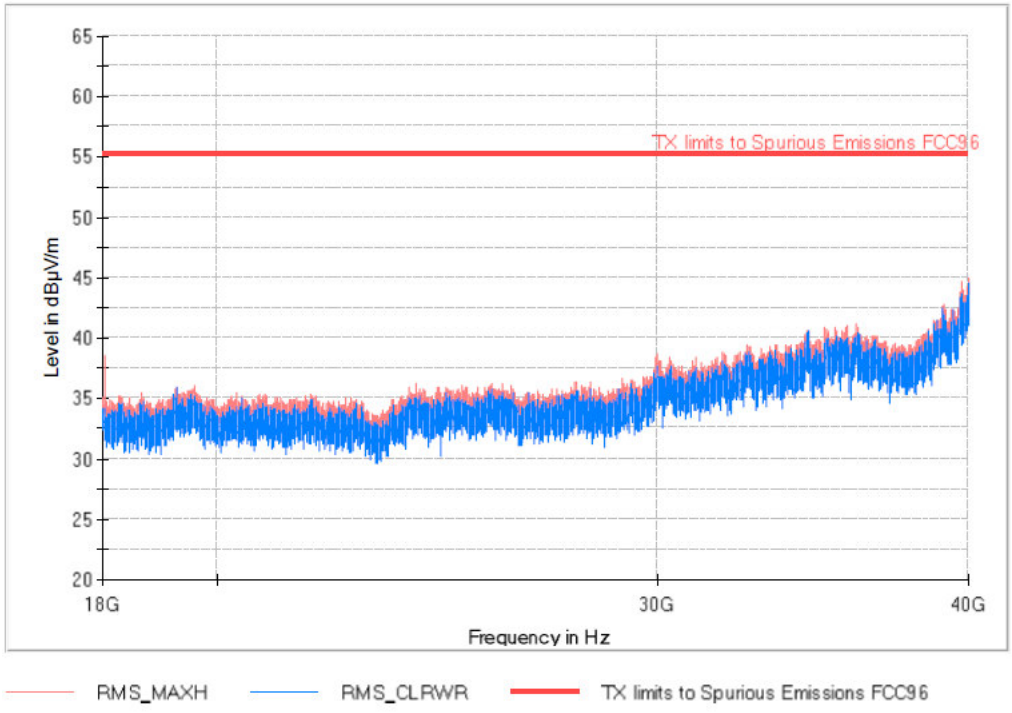
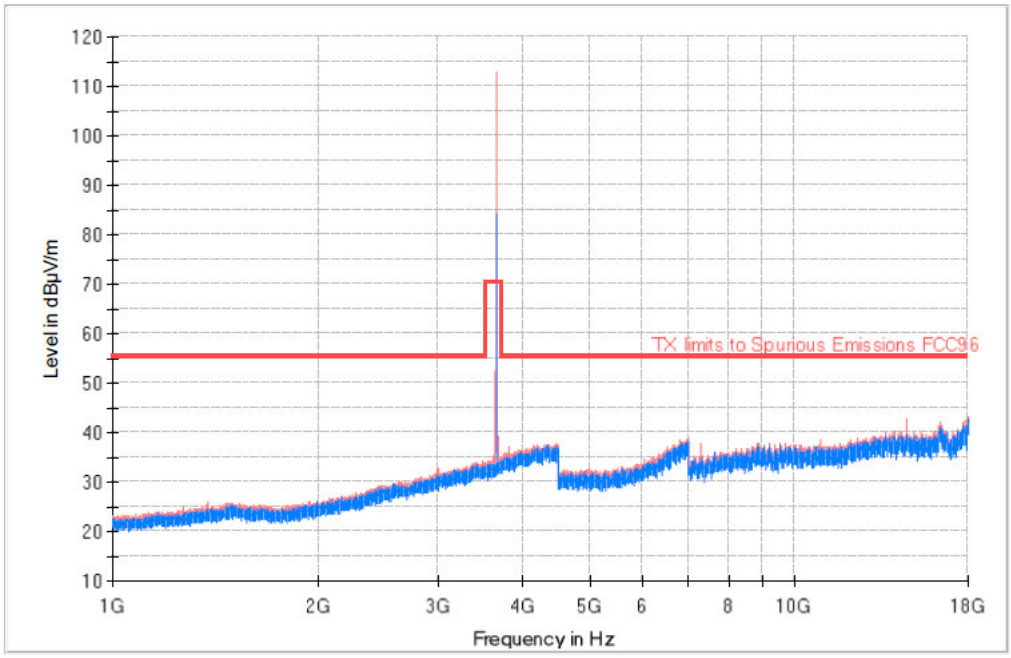
Band 43_BW15M_Low Channel
FREQUENCY RANGE 1-18 GHz



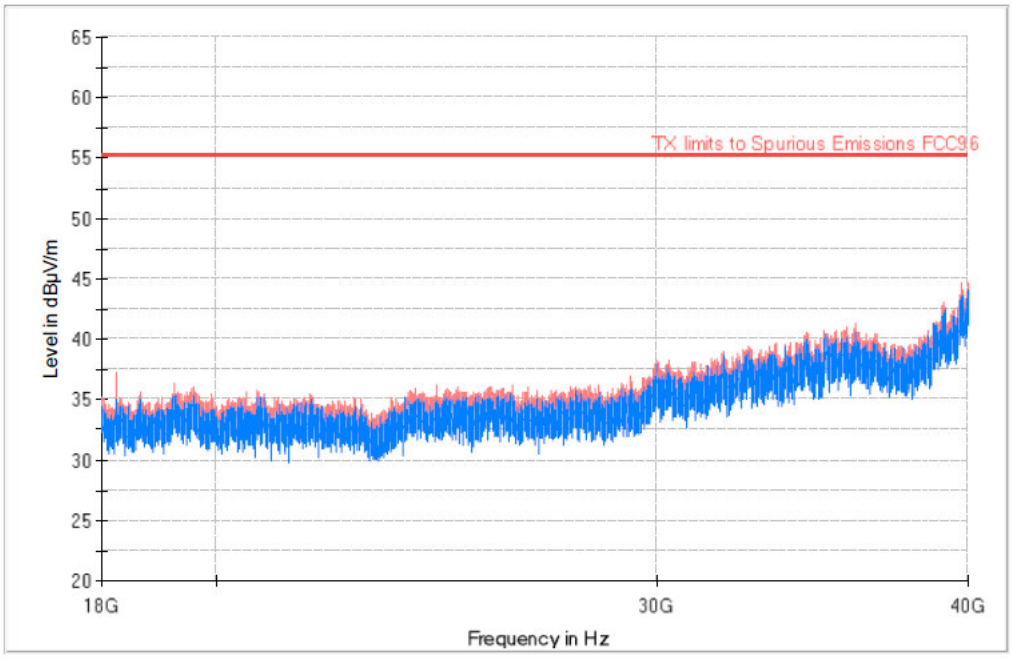
Band 43_BW15M_Low Channel
FREQUENCY RANGE 18-40 GHz



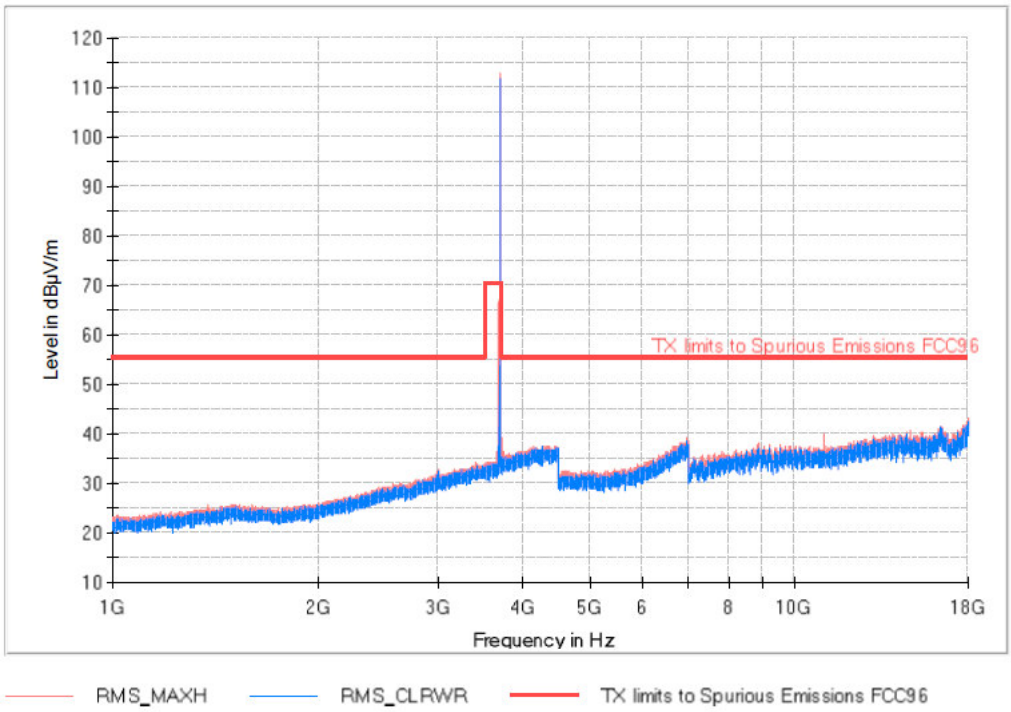
Band 43_BW15M_Middle Channel
FREQUENCY RANGE 1-18 GHz



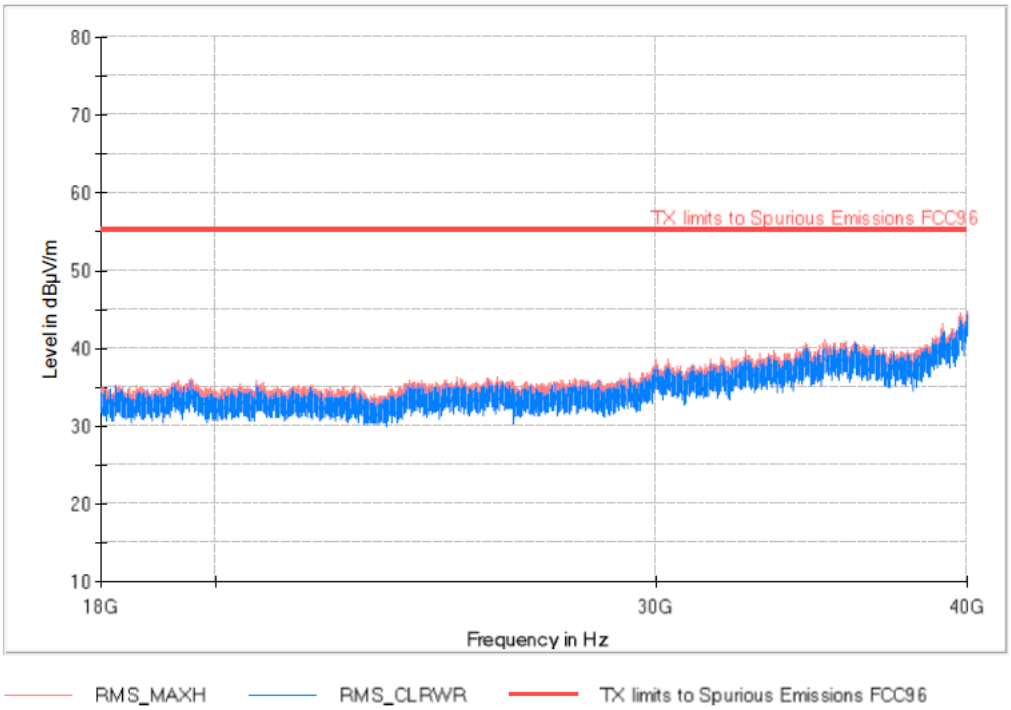
Band 43_BW15M_Middle Channel
FREQUENCY RANGE 18-40 GHz



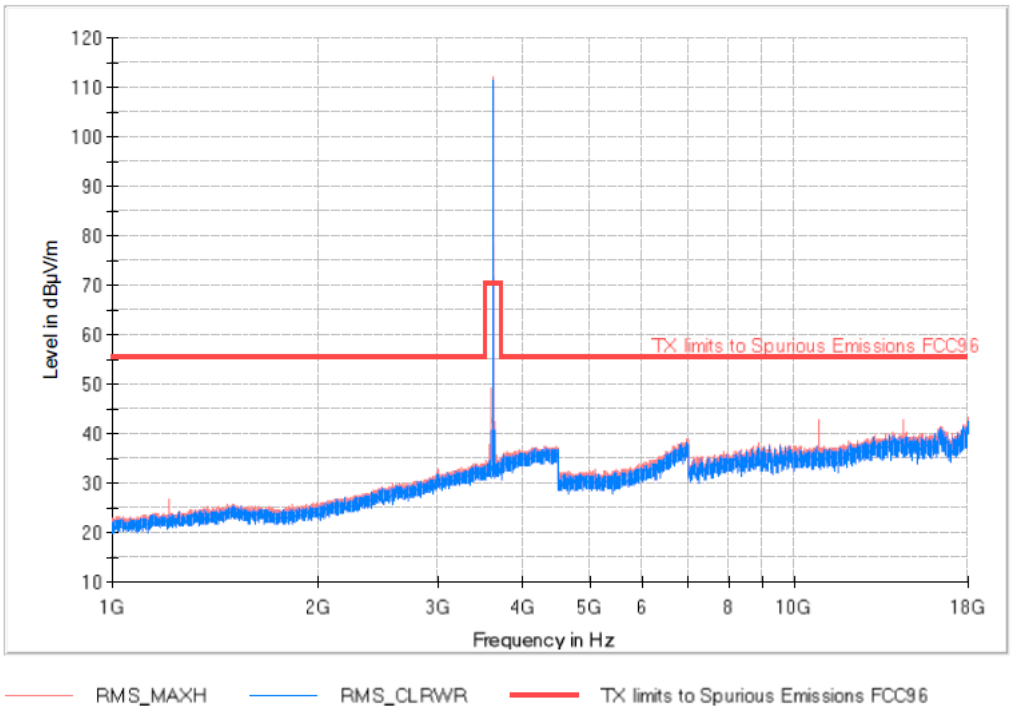
Band 43_BW15M_High Channel
FREQUENCY RANGE 1-18 GHz



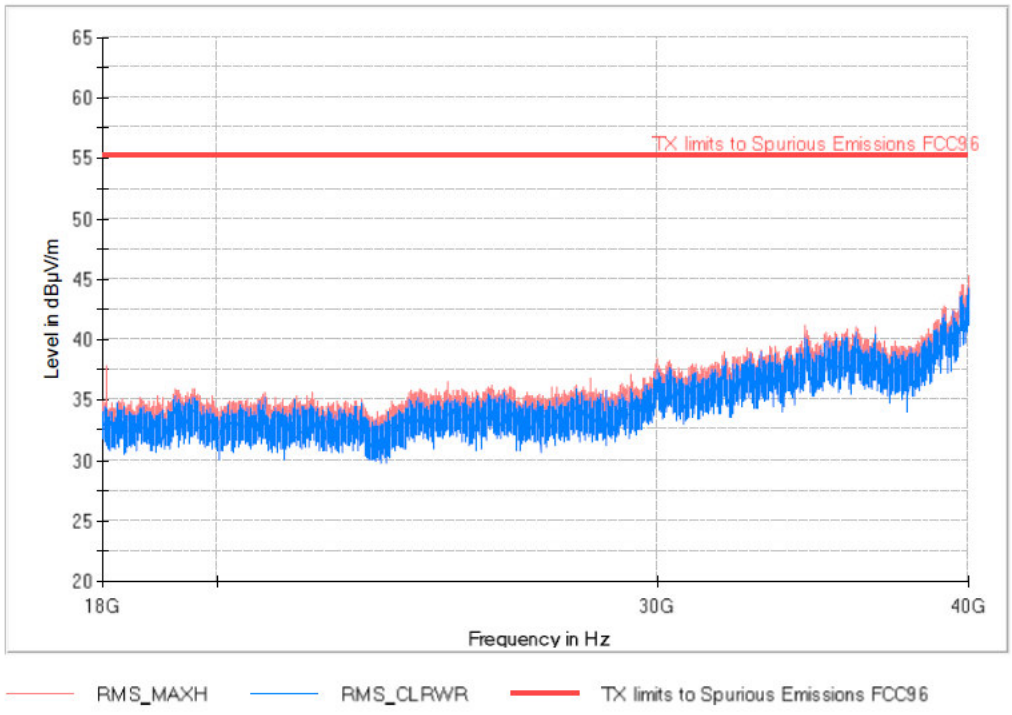
Band 43_BW15M_High Channel
FREQUENCY RANGE 18-40 GHz



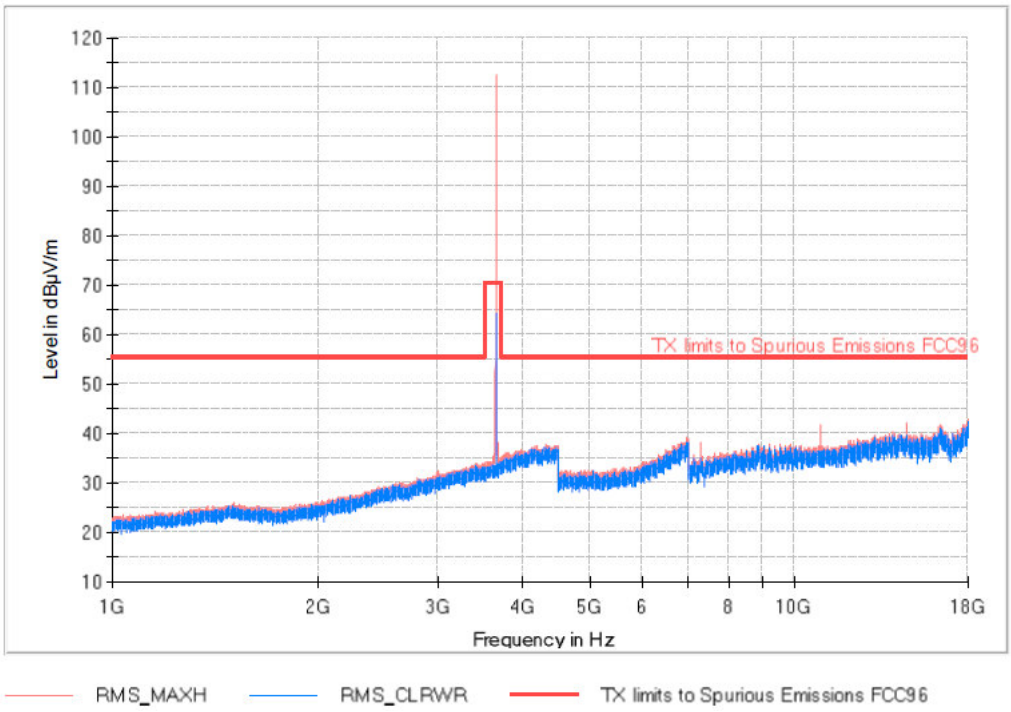
Band 43_BW20M_Low Channel
FREQUENCY RANGE 1-18 GHz



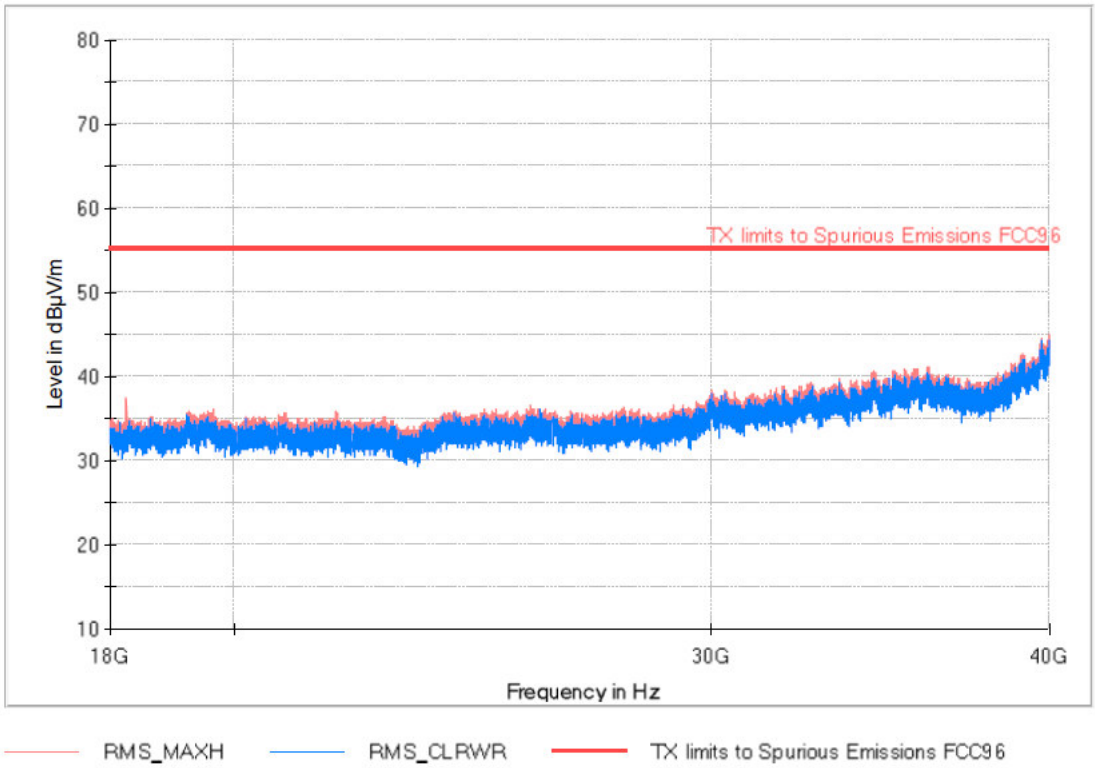
Band 43_BW20M_Low Channel
FREQUENCY RANGE 18-40 GHz



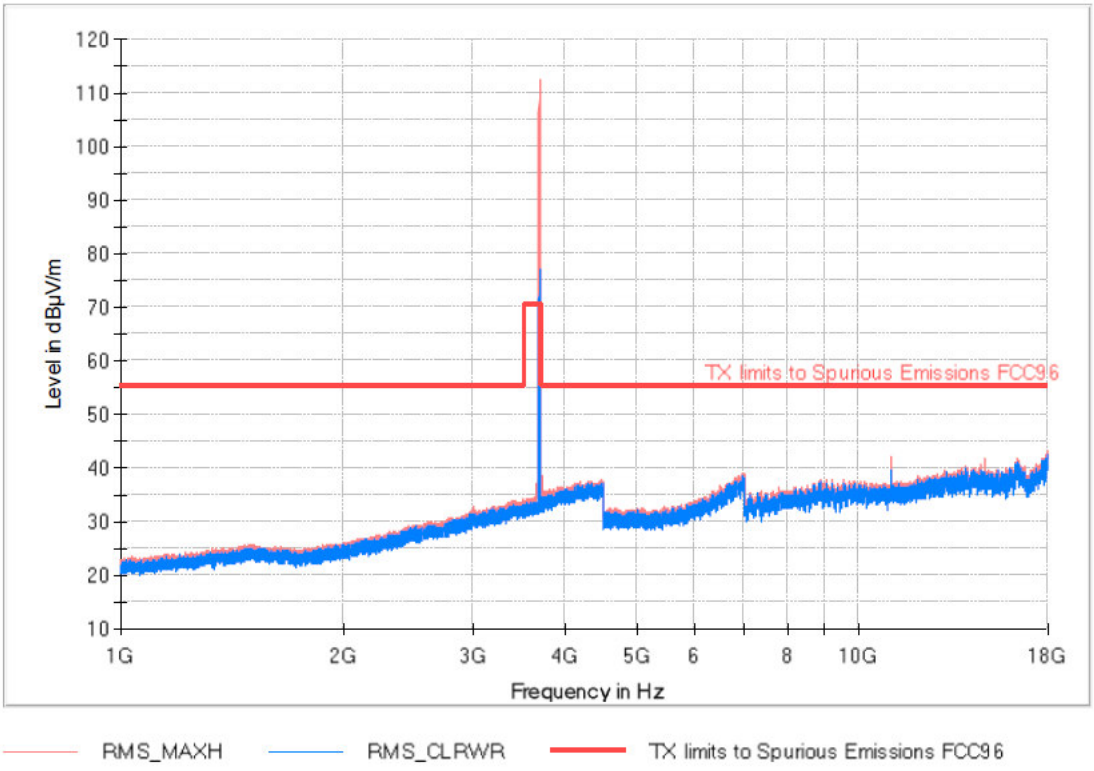
Band 43_BW20M_Middle Channel
FREQUENCY RANGE 1-18 GHz



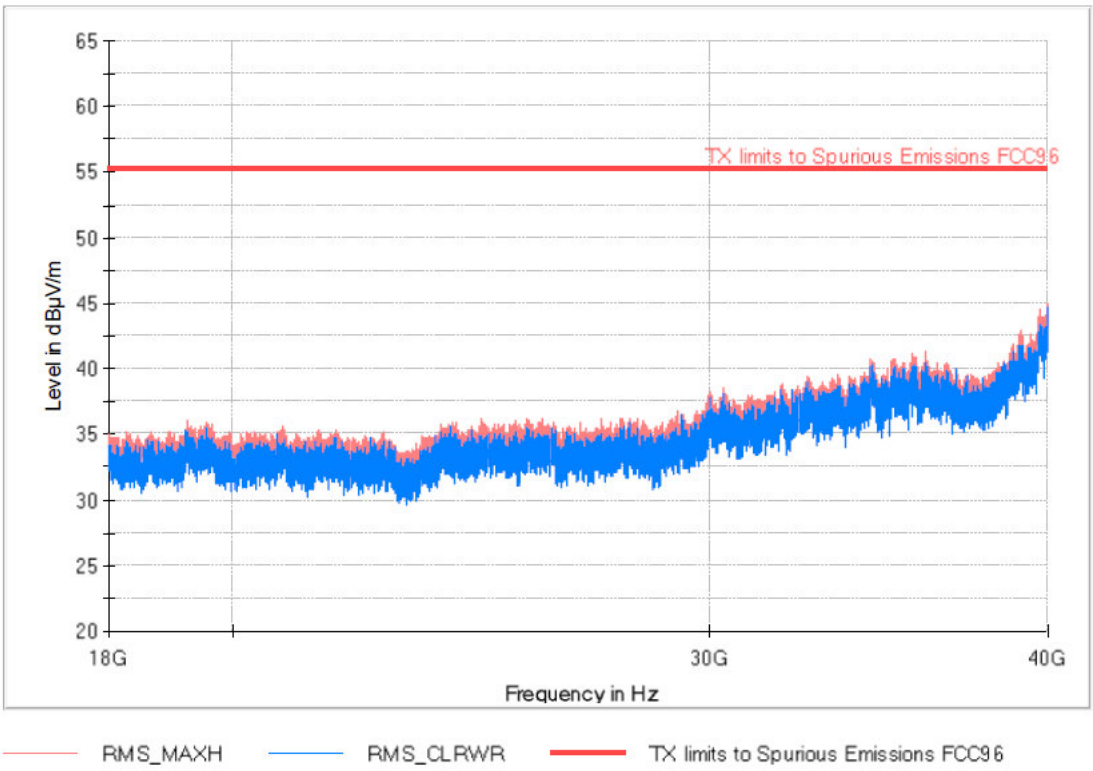
Band 43_BW20M_Middle Channel
FREQUENCY RANGE 18-40 GHz



Band 43_BW20M_High Channel
FREQUENCY RANGE 1-18 GHz



Band 43_BW20M_High Channel
FREQUENCY RANGE 18-40 GHz

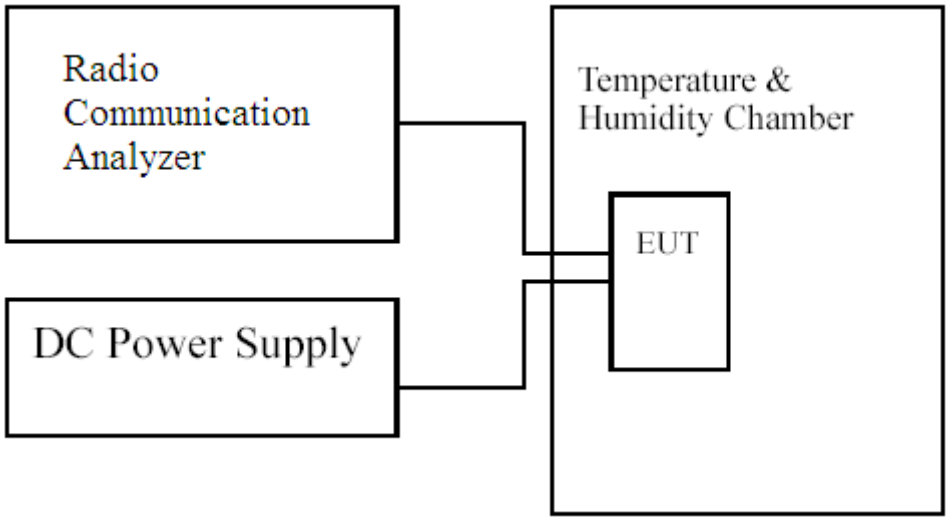


7. Frequency Stability Under Temperature & Voltage Variations

7.1. Test Specification

According to Part 2.1055

7.2. Test Setup



7.3. Limits

Limit	**<±2.5ppm**

7.4. Test Procedure

The frequency stability of transmitter is measured by:

(a) Temperature: The temperature is varied from -30°C to 50°C in 10°C increment using a standard temperature & Humidity chamber.

(b) Primary Supply Voltage: The primary supply voltage is varied 85% to 115% of the nominal value for non hand-carried equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating endpoint which shall be specified by the manufacturer.

The EUT was connected via the base station simulator. Universal Radio Communication Tester, was used to measure The Frequency Error. The maximum result of measurements was recorded.

7.5. Test Result of Frequency Stability Under Temperature & Voltage Variations

Band48_BW10M

Temperature (°C)	Input Voltage (V)	Lowest Frequency 3555 MHz			
		Frequency (MHz)	Delta to Tnom-Vnom (%)	Frequency (MHz)	Delta to Tnom-Vnom (%)
50	3.7	3550.530	-0.001690	3559.410	-0.002248
40	3.7	3550.570	-0.000563	3559.470	-0.000562
30	3.7	3550.610	0.000563	3559.450	-0.001124
20 (Tnom)	3.7	3550.590	----	3559.490	----
20	3.145	3550.610	0.000563	3559.470	-0.000562
20	4.255	3550.550	-0.001127	3559.430	-0.001686
10	3.7	3550.570	-0.000563	3559.450	-0.001124
0	3.7	3550.730	0.003943	3559.310	-0.005057
-10	3.7	3550.510	-0.002253	3559.470	-0.000562
-20	3.7	3550.650	0.001690	3559.430	-0.001686
-30	3.7	3550.550	-0.001127	3559.450	-0.001124

Temperature (°C)	Input Voltage (V)	Highest Frequency 3695 MHz			
		Frequency (MHz)	Delta to Tnom-Vnom (%)	Frequency (MHz)	Delta to Tnom-Vnom (%)
50	3.7	3690.530	-0.001084	3699.450	0.001622
40	3.7	3690.510	-0.001626	3699.450	0.001622
30	3.7	3690.610	0.001084	3699.430	0.001081
20 (Tnom)	3.7	3690.570	----	3699.390	----
20	3.145	3690.670	0.002710	3699.410	0.000541
20	4.255	3690.550	-0.000542	3699.370	-0.000541
10	3.7	3690.590	0.000542	3699.410	0.000541
0	3.7	3690.670	0.002710	3699.430	0.001081
-10	3.7	3690.550	-0.000542	3699.350	-0.001081
-20	3.7	3690.590	0.000542	3699.370	-0.000541
-30	3.7	3690.610	0.001084	3699.350	-0.237336

Band42_BW10M

Temperature (°C)	Input Voltage (V)	Lowest Frequency 3555 MHz			
		Frequency (MHz)	Delta to Tnom-Vnom (%)	Frequency (MHz)	Delta to Tnom-Vnom (%)
50	3.7	3550.530	-0.001690	3559.410	-0.002248
40	3.7	3550.570	-0.000563	3559.470	-0.000562
30	3.7	3550.610	0.000563	3559.450	-0.001124
20 (Tnom)	3.7	3550.590	----	3559.490	----
20	3.145	3550.610	0.000563	3559.470	-0.000562
20	4.255	3550.550	-0.001127	3559.430	-0.001686
10	3.7	3550.570	-0.000563	3559.450	-0.001124
0	3.7	3550.730	0.003943	3559.310	-0.005057
-10	3.7	3550.510	-0.002253	3559.470	-0.000562
-20	3.7	3550.650	0.001690	3559.430	-0.001686
-30	3.7	3550.550	-0.001127	3559.450	-0.001124

Temperature (°C)	Input Voltage (V)	Highest Frequency 3595 MHz			
		Frequency (MHz)	Delta to Tnom-Vnom (%)	Frequency (MHz)	Delta to Tnom-Vnom (%)
50	3.7	3590.630	0.002228	3599.450	0.001667
40	3.7	3590.610	0.001671	3599.430	0.001111
30	3.7	3590.590	0.001114	3599.330	-0.001667
20 (Tnom)	3.7	3590.550	----	3599.390	----
20	3.145	3590.530	-0.000557	3599.450	0.001667
20	4.255	3590.510	-0.001114	3599.410	0.000556
10	3.7	3590.530	-0.000557	3599.430	0.001111
0	3.7	3590.610	0.001671	3599.450	0.001667
-10	3.7	3590.630	0.002228	3599.370	-0.000556
-20	3.7	3590.610	0.001671	3599.350	-0.001111
-30	3.7	3590.630	0.002228	3599.430	0.001111

Band43_BW10M

Temperature (°C)	Input Voltage (V)	Lowest Frequency 3605 MHz			
		Frequency (MHz)	Delta to Tnom-Vnom (%)	Frequency (MHz)	Delta to Tnom-Vnom (%)
50	3.7	3600.550	0.012500	3609.490	0.002216
40	3.7	3600.690	0.016388	3609.390	-0.000554
30	3.7	3600.710	0.016944	3609.350	-0.001662
20 (Tnom)	3.7	3600.100	----	3609.410	----
20	3.145	3600.550	0.012500	3609.430	0.000554
20	4.255	3600.530	0.011944	3609.450	0.001108
10	3.7	3600.710	0.016944	3609.330	-0.002216
0	3.7	3600.730	0.017500	3609.350	-0.001662
-10	3.7	3600.690	0.016388	3609.310	-0.002771
-20	3.7	3600.650	0.015277	3609.390	-0.000554
-30	3.7	3600.630	0.014722	3609.370	-0.001108

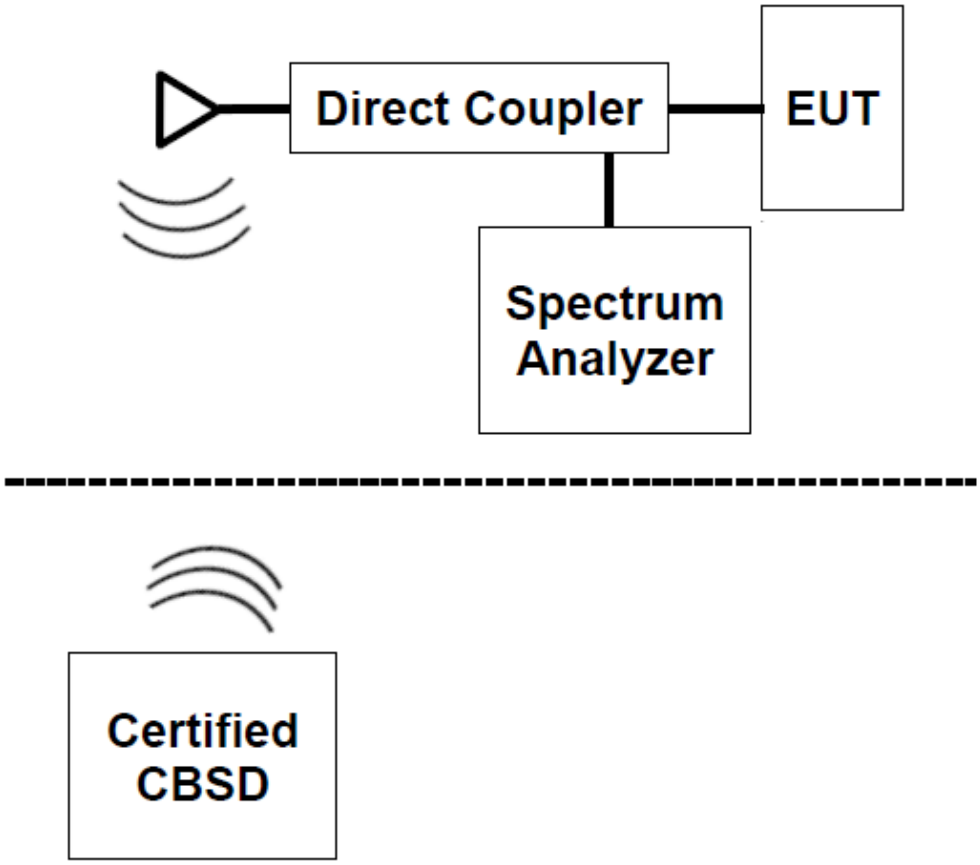
Temperature (°C)	Input Voltage (V)	Highest Frequency 3695 MHz			
		Frequency (MHz)	Delta to Tnom-Vnom (%)	Frequency (MHz)	Delta to Tnom-Vnom (%)
50	3.7	3690.530	-0.001084	3699.450	0.001622
40	3.7	3690.510	-0.001626	3699.450	0.001622
30	3.7	3690.610	0.001084	3699.430	0.001081
20 (Tnom)	3.7	3690.570	----	3699.390	----
20	3.145	3690.670	0.002710	3699.410	0.000541
20	4.255	3690.550	-0.000542	3699.370	-0.000541
10	3.7	3690.590	0.000542	3699.410	0.000541
0	3.7	3690.670	0.002710	3699.430	0.001081
-10	3.7	3690.550	-0.000542	3699.350	-0.001081
-20	3.7	3690.590	0.000542	3699.370	-0.000541
-30	3.7	3690.610	0.001084	3699.350	-0.001081

8. End User Device Additional Requirements

8.1. Test Specification

According to Part 96.47

8.2. Test Setup



8.3. Limits

End User Devices may operate only if they can positively receive and decode an authorization signal transmitted by a CBSD, including the frequencies and power limits for their operation. An End User Device must discontinue operations, change frequencies, or change its operational power level within 10 seconds of receiving instructions from its associated CBSD.

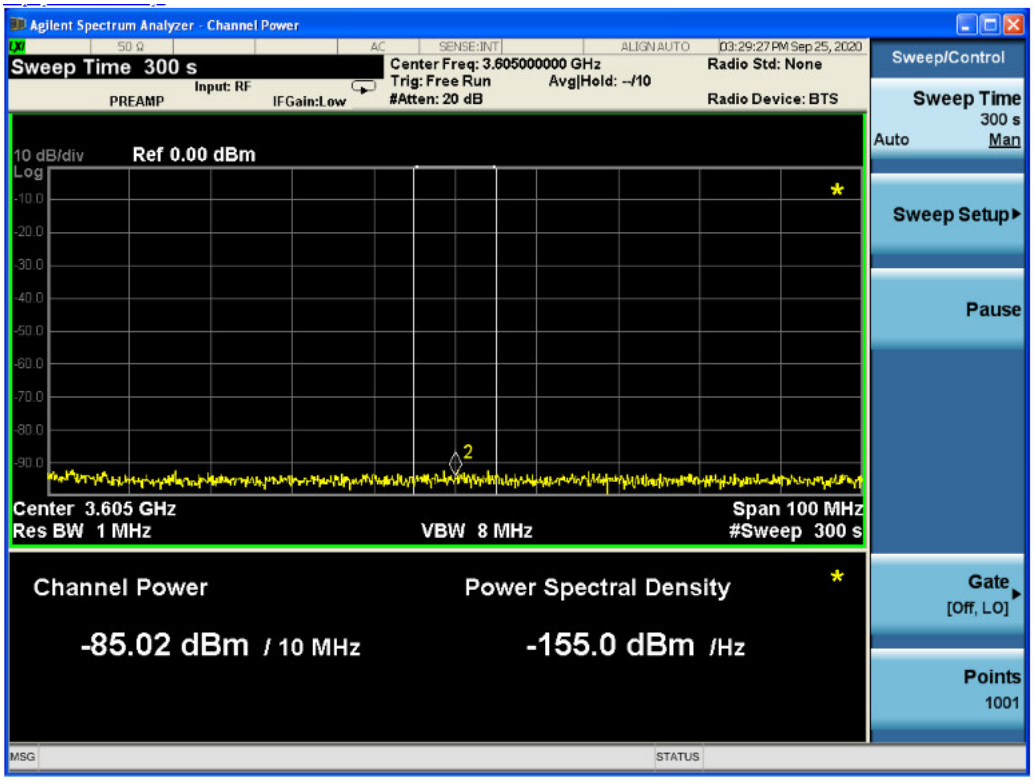
8.4. Test Procedure

Test procedure described in document WINNF-18-IN-00178 CBRS End User Device as UUT Test Guidelines has been used as a reference. The below test steps have been executed as part of this activity:

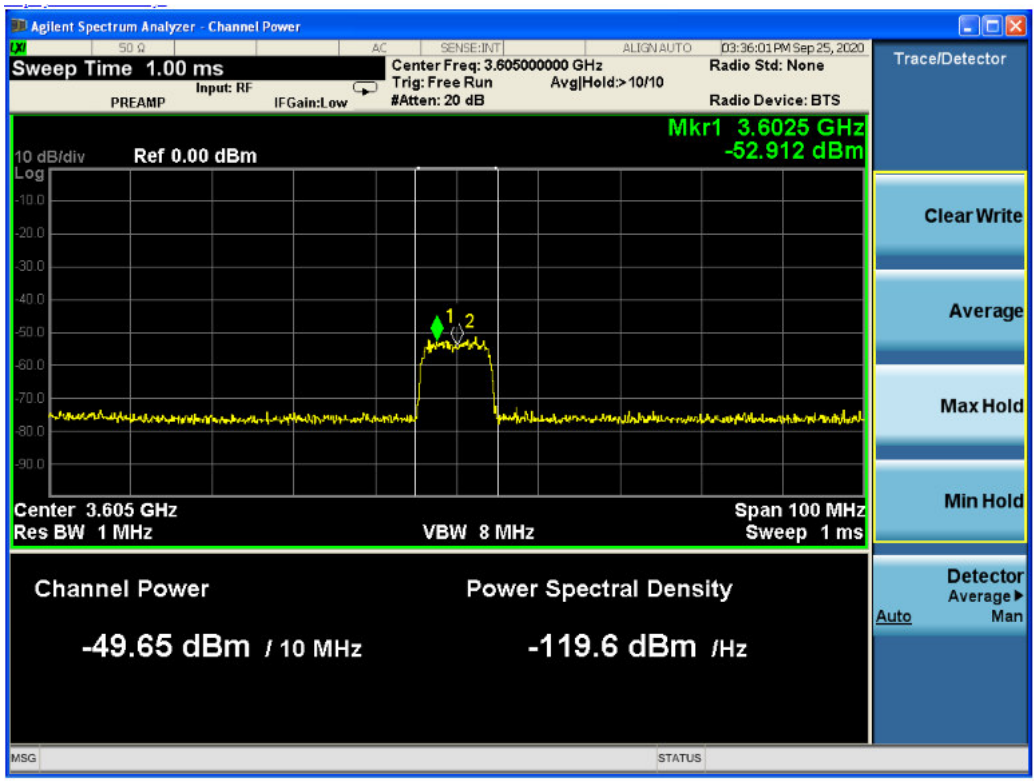
1. Set CBSD to not transmit
2. Turn DUT on, verify during 300seconds that DUT doesn´t transmit
3. Set CBSD to transmit in 3600-3620MHz band with a power level of 0dB/MHz
4. Reboot DUT
5. Verify DUT Transmit frequency and Power Level
6. Disable CBSD transmission
7. Verify DUT stops transmitting within 10s
8. Set CBSD to transmit in 3650-3660MHz band with a power level of 37dB/MHz
9. Verify DUT Transmit frequency and Power Level

8.5. Test Result of End User Device Additional Requirements

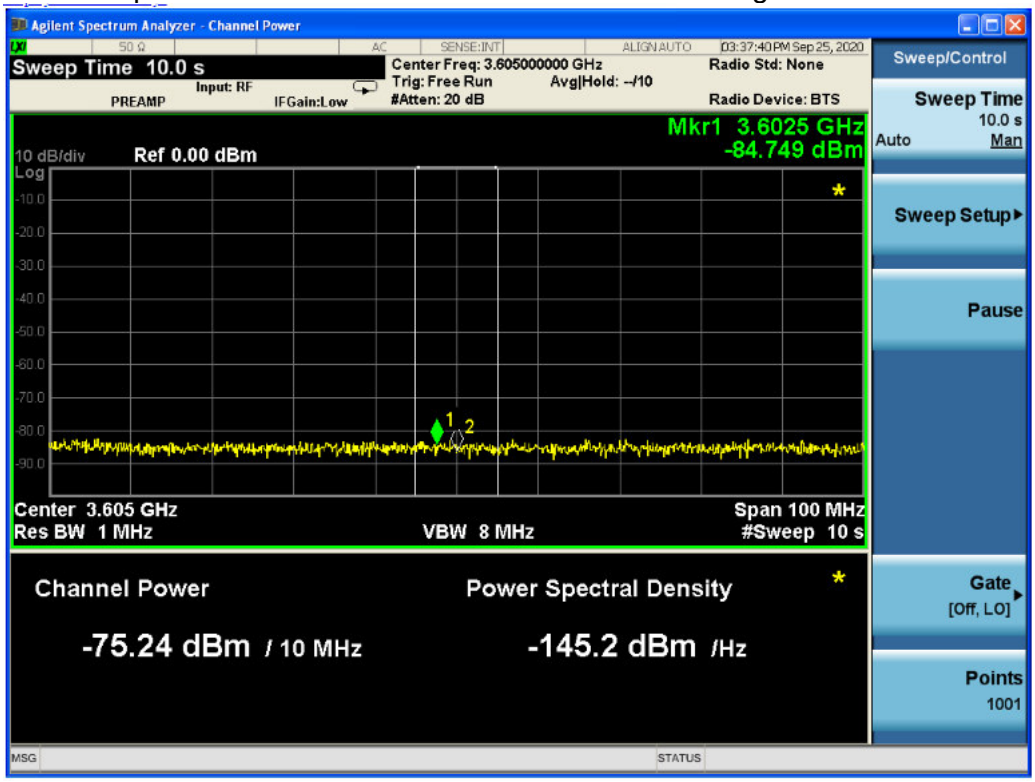
DUT is not transmitting



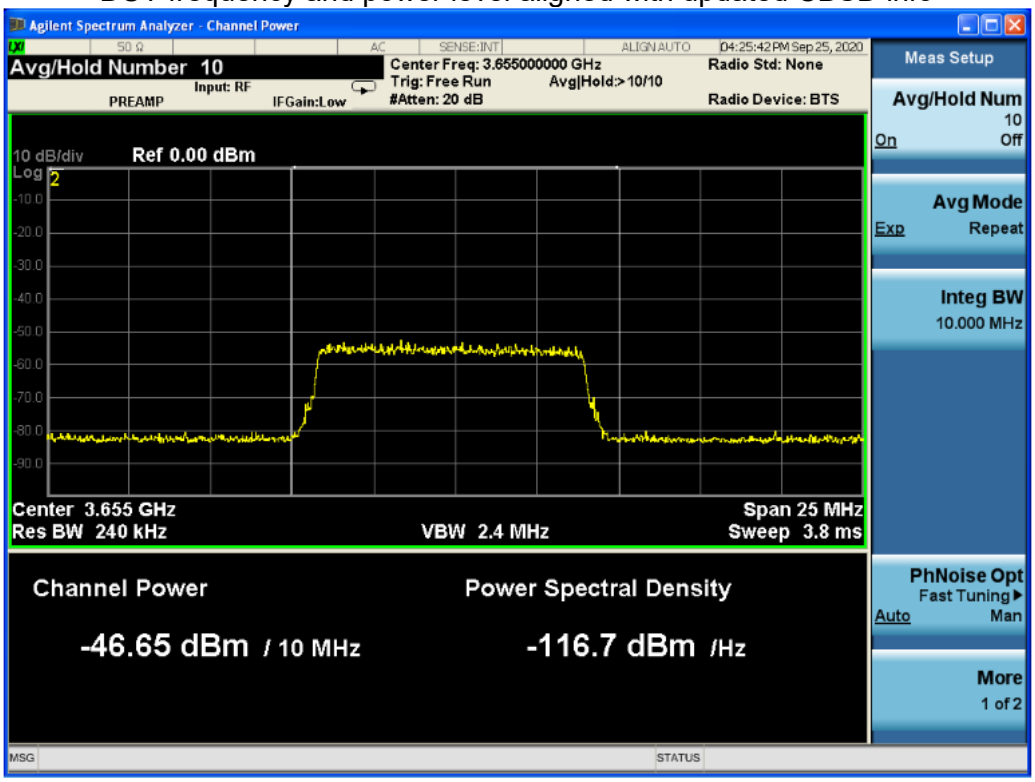
DUT frequency and power level aligned with CBSD info



DUT stops transmission within 10 seconds after disabling the CBSD service



DUT frequency and power level aligned with updated CBSD info

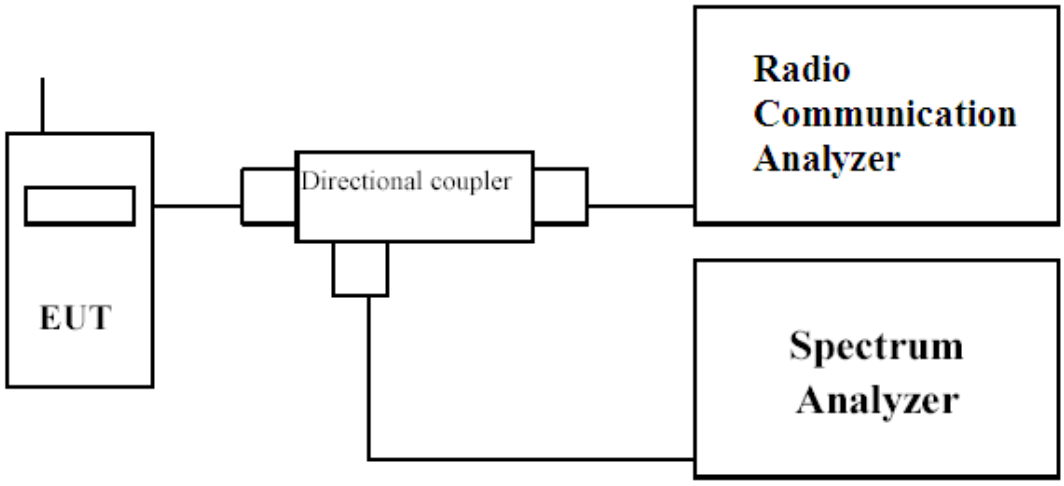


9. Peak to Average Ratio

9.1. Test Specification

According to Part 96.41

9.2. Test Setup



9.3. Limits

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure.

9.4. Test Procedure

a) Refer to instrument's analyzer instruction manual for details on how to use the power statistics/CCDF function;
b) Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
c) Set the number of counts to a value that stabilizes the measured CCDF curve;
d) Set the measurement interval as follows:
1) for continuous transmissions, set to 1 ms,
2) for burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize and set the measurement interval to a time that is less than or equal to the burst duration.
e) Record the maximum PAPR level associated with a probability of 0.1%.

9.5. Test Result of Peak to Average Ratio

Band 48_BW 5MHz

	Lowest frequency 3552.5 MHz	Middle frequency 3625 MHz	Highest frequency 3697.5 MHz
Peak (dBm)	25.51	25.09	25.09
Mean (dBm)	16.89	16.34	15.75
PAPR at 0.1% probability (dB)	8.55	8.72	9.30

Band 48_BW 10MHz

	Lowest frequency 3555 MHz	Middle frequency 3625 MHz	Highest frequency 3695 MHz
Peak (dBm)	22.28	22.57	21.85
Mean (dBm)	12.17	12.46	12.03
PAPR at 0.1% probability (dB)	10.06	10.03	9.65

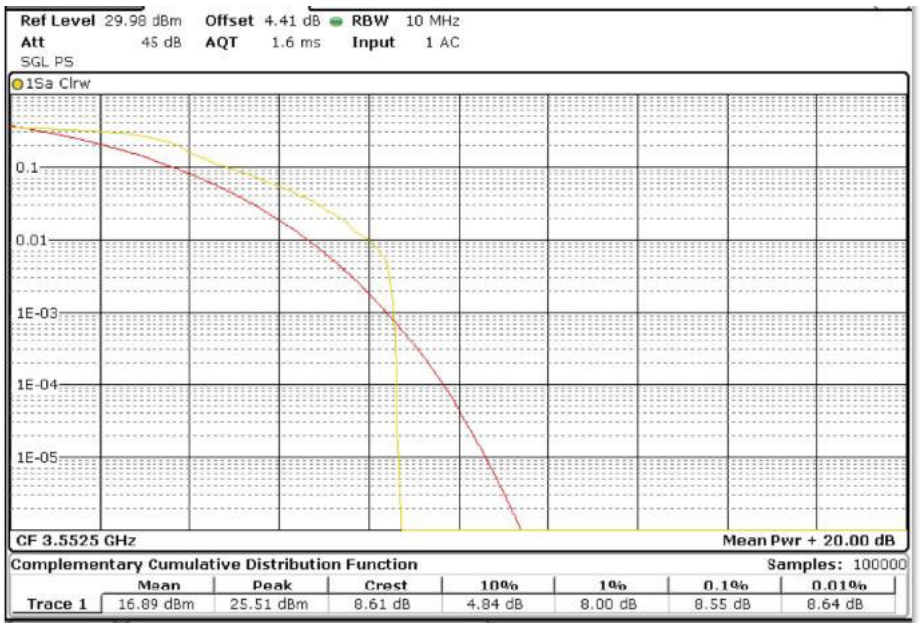
Band 48_BW 15MHz

	Lowest frequency 3557.5 MHz	Middle frequency 3625 MHz	Highest frequency 3692.5 MHz
Peak (dBm)	23.01	25.27	25.17
Mean (dBm)	12.88	15.32	14.77
PAPR at 0.1% probability (dB)	10.12	9.91	10.29

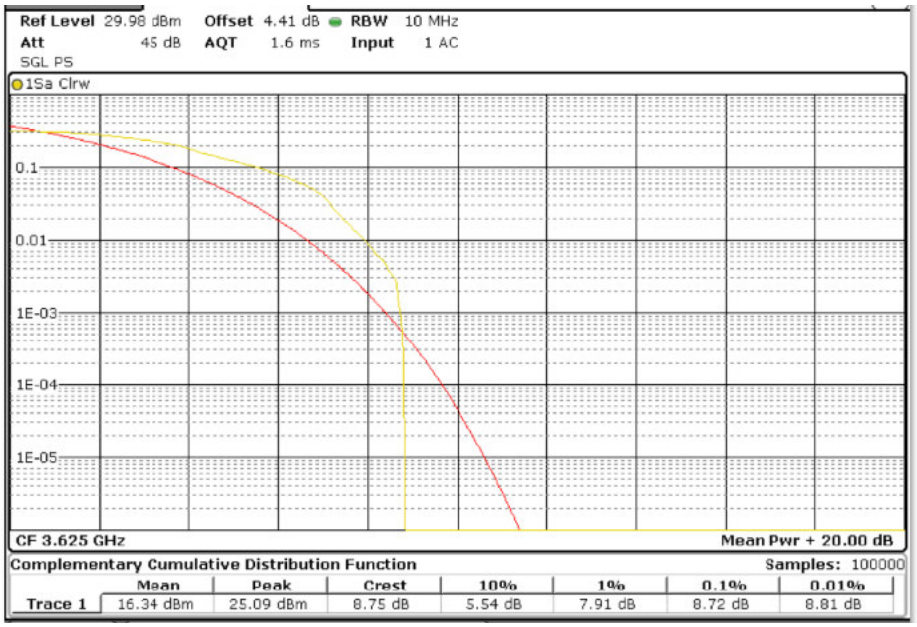
Band 48_BW 20MHz

	Lowest frequency 3560 MHz	Middle frequency 3625 MHz	Highest frequency 3690 MHz
Peak (dBm)	22.48	19.07	19.04
Mean (dBm)	11.92	8.54	8.23
PAPR at 0.1% probability (dB)	10.52	9.83	10.14

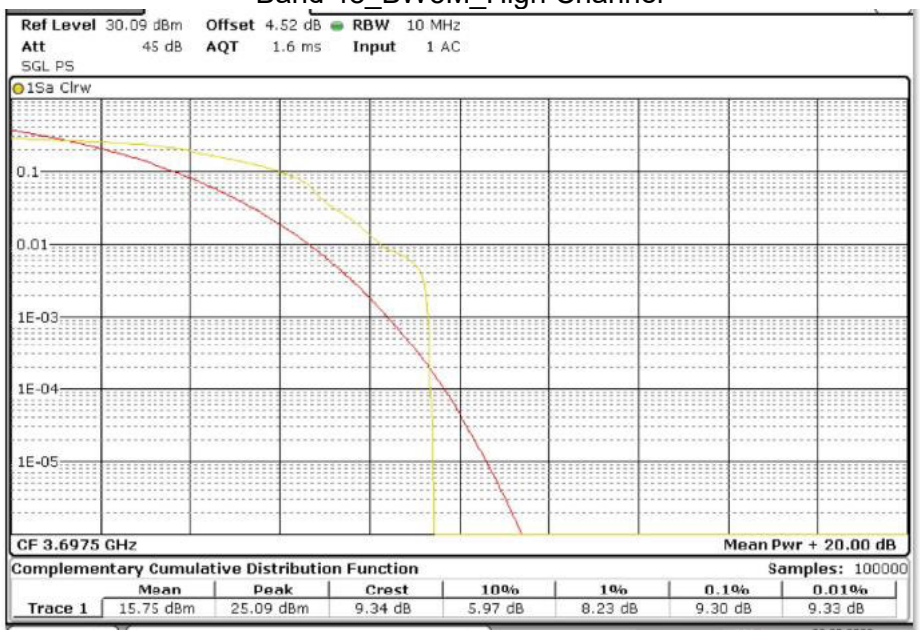
Band 48_BW5M_Low Channel



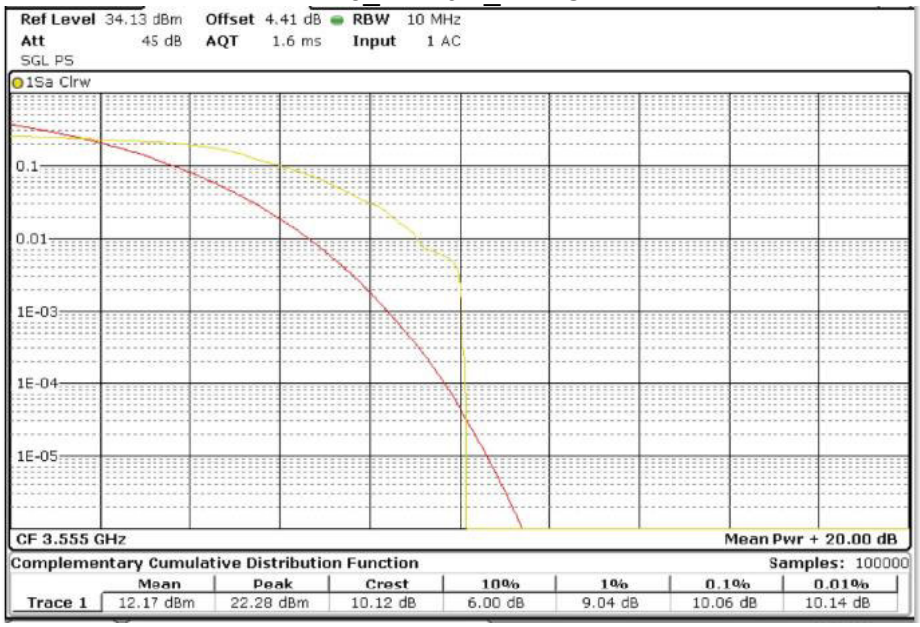
Band 48_BW5M_Middle Channel



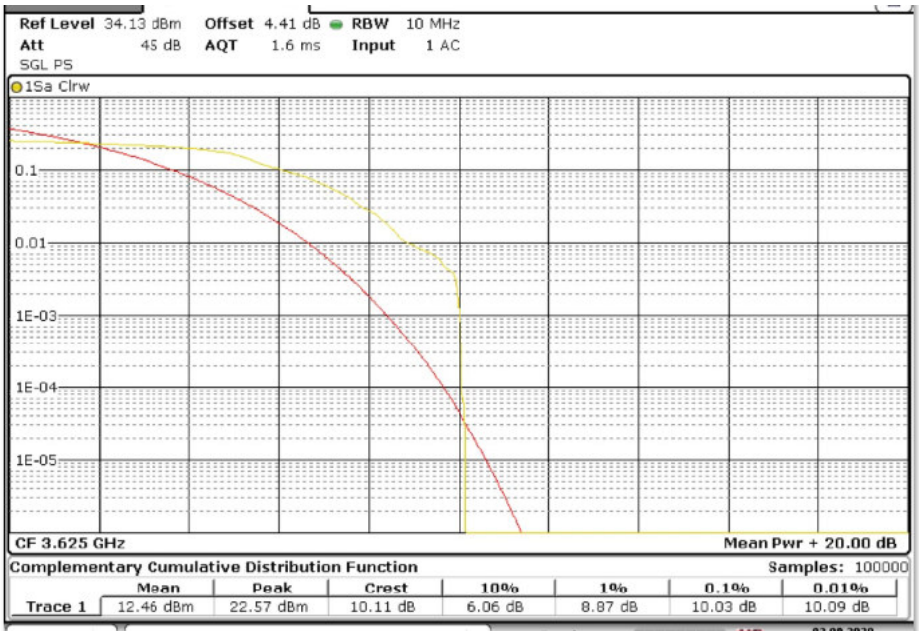
Band 48_BW5M_High Channel



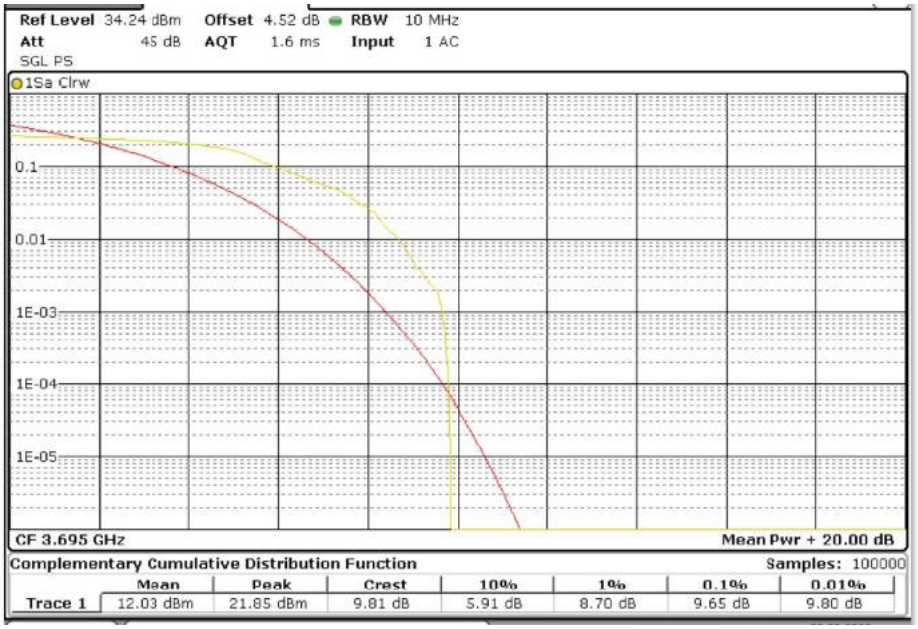
Band 48_BW10M_Low Channel



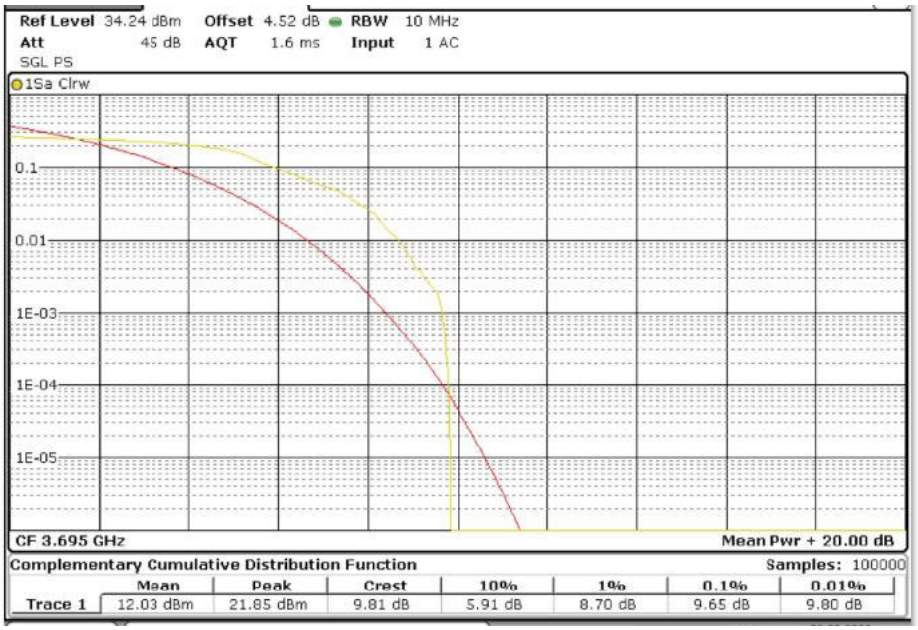
Band 48_BW10M_Middle Channel



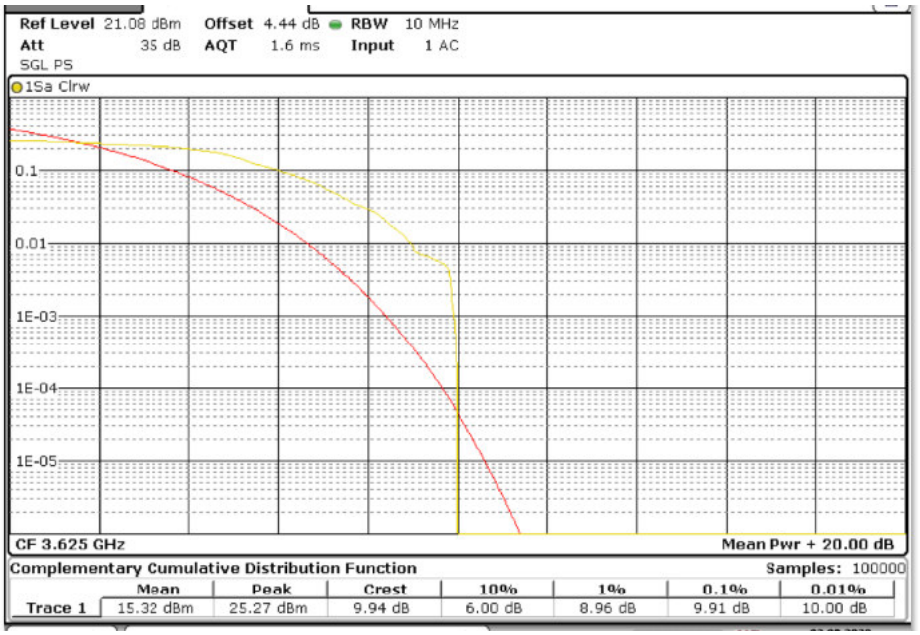
Band 48_BW10M_High Channel



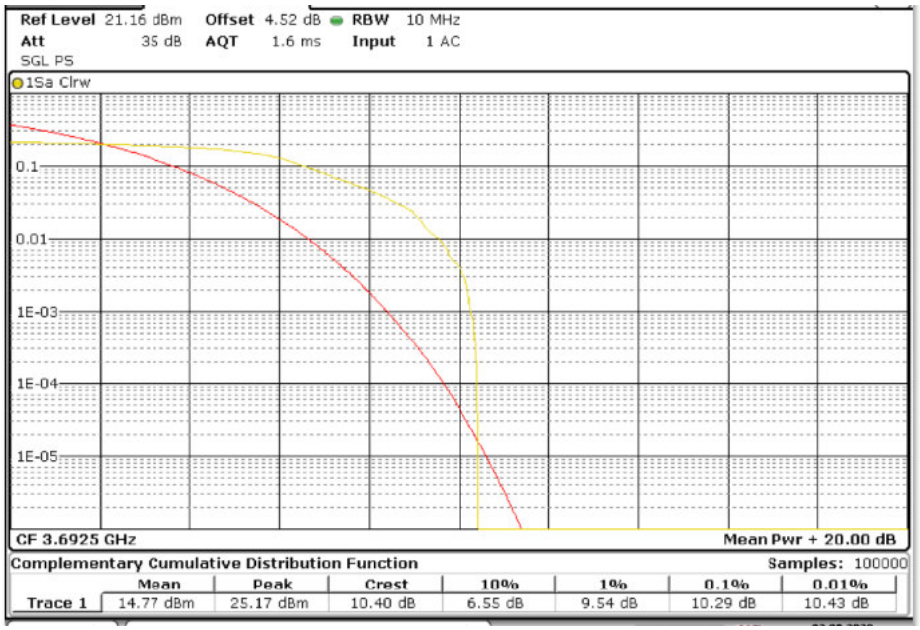
Band 48_BW15M_Low Channel



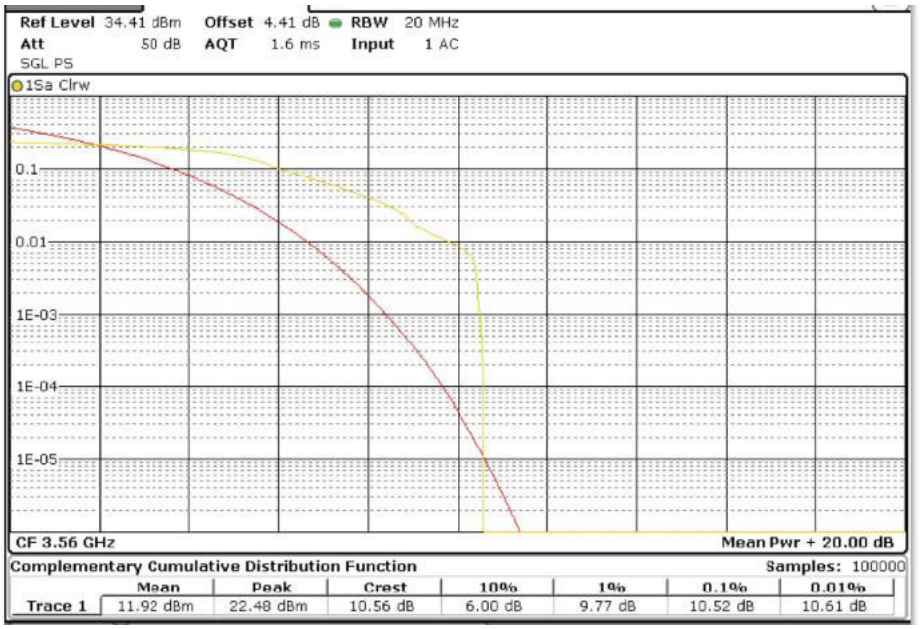
Band 48_BW15M_Middle Channel



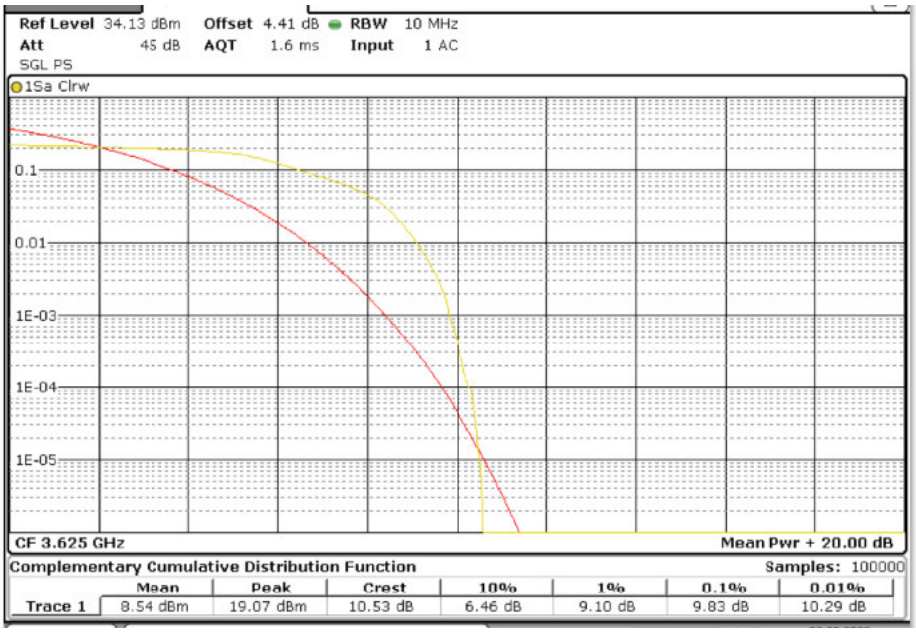
Band 48_BW15M_High Channel



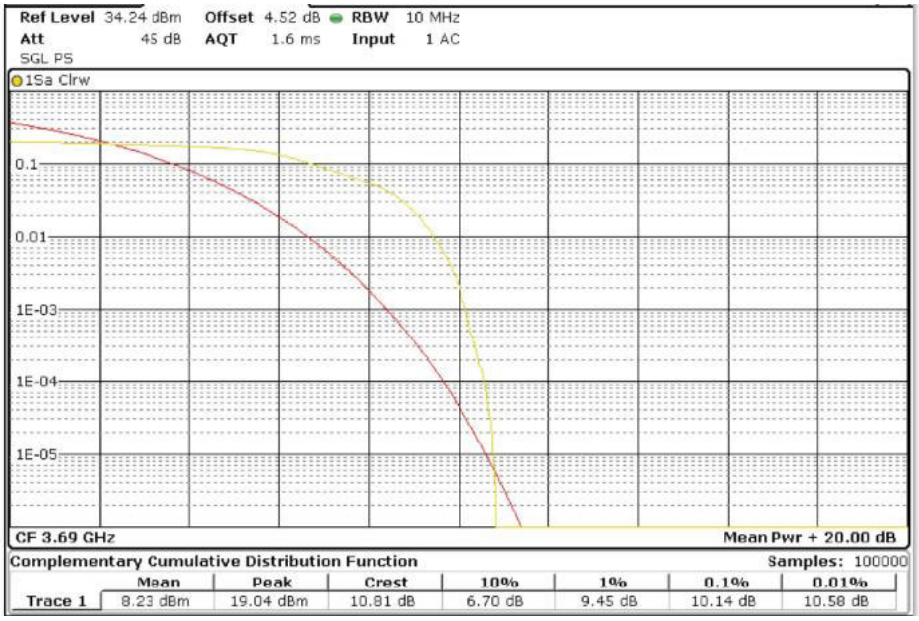
Band 48_BW20M_Low Channel



Band 48_BW20M_Middle Channel



Band 48_BW20M_High Channel



Band 42_BW 5MHz

	Lowest frequency 3552.5 MHz	Middle frequency 3575 MHz	Highest frequency 3597.5 MHz
Peak (dBm)	25.51	24.75	24.79
Mean (dBm)	16.89	13.95	14.57
PAPR at 0.1% probability (dB)	8.55	10.75	10.20

Band 42_BW 10MHz

	Lowest frequency 3555 MHz	Middle frequency 3575 MHz	Highest frequency 3595 MHz
Peak (dBm)	22.28	24.67	24.64
Mean (dBm)	12.17	15.52	15.10
PAPR at 0.1% probability (dB)	10.06	9.04	9.42

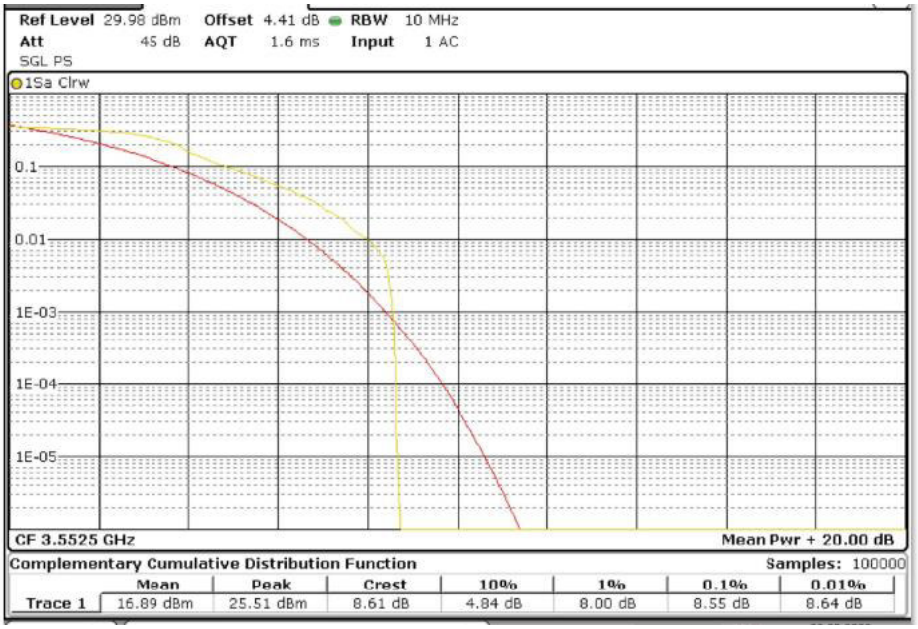
Band 42_BW 15MHz

	Lowest frequency 3557.5 MHz	Middle frequency 3575 MHz	Highest frequency 3592.5 MHz
Peak (dBm)	23.01	24.35	25.00
Mean (dBm)	12.88	13.68	15.05
PAPR at 0.1% probability (dB)	10.12	10.58	9.86

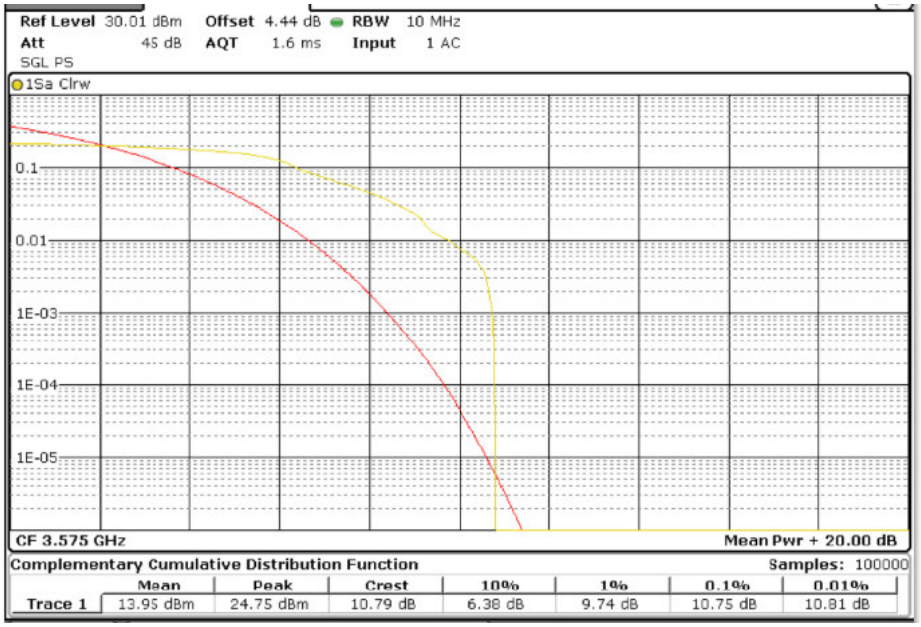
Band 42_BW 20MHz

	Lowest frequency 3560 MHz	Middle frequency 3575 MHz	Highest frequency 3590 MHz
Peak (dBm)	22.48	24.26	24.67
Mean (dBm)	11.92	13.95	14.15
PAPR at 0.1% probability (dB)	10.52	10.17	10.49

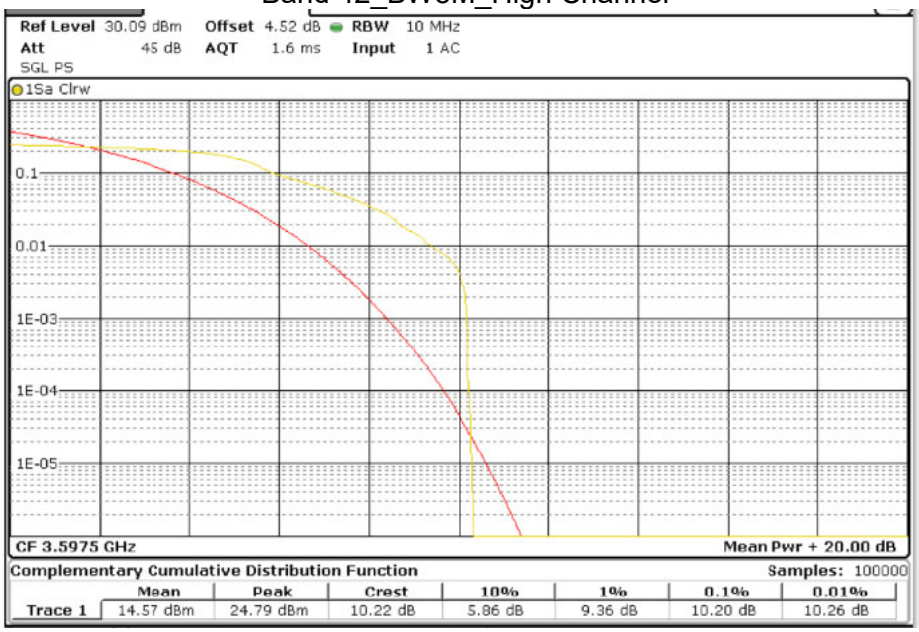
Band 42_BW5M_Low Channel



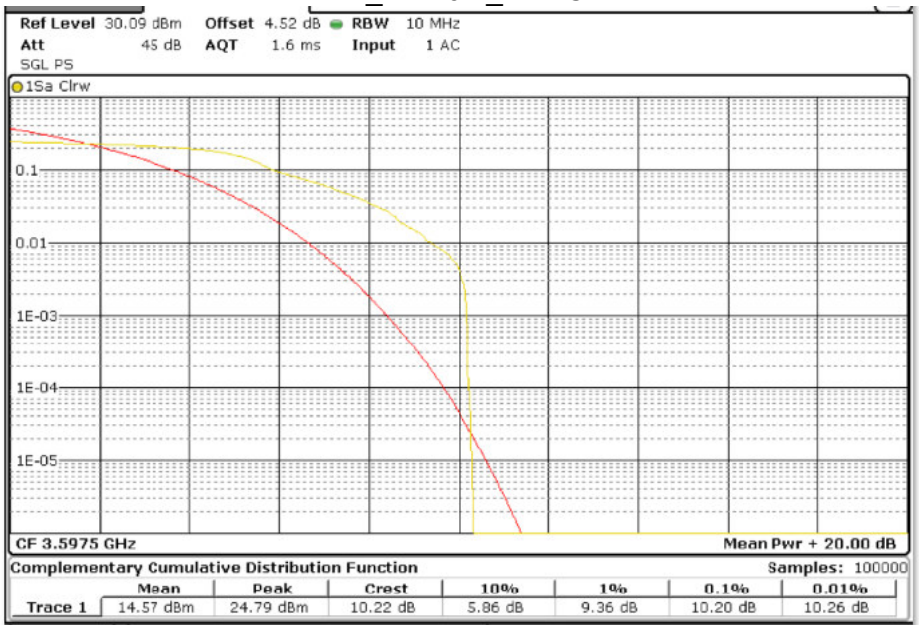
Band 42_BW5M_Middle Channel



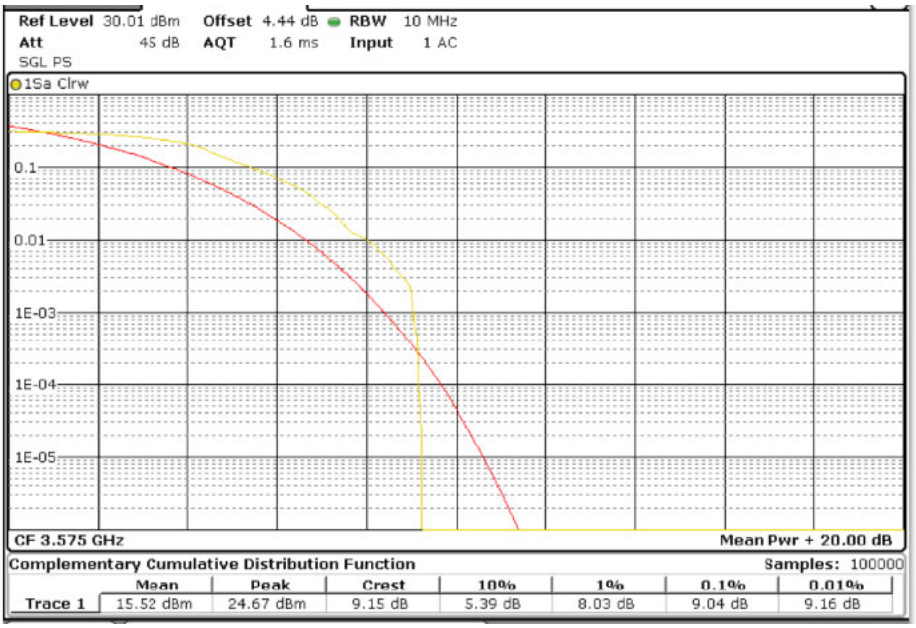
Band 42_BW5M_High Channel



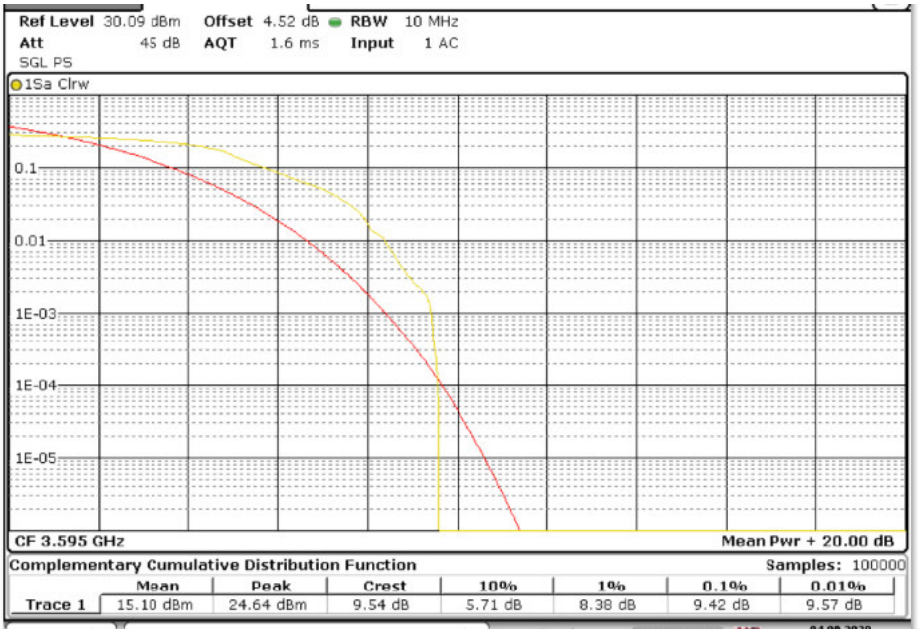
Band 42_BW10M_Low Channel



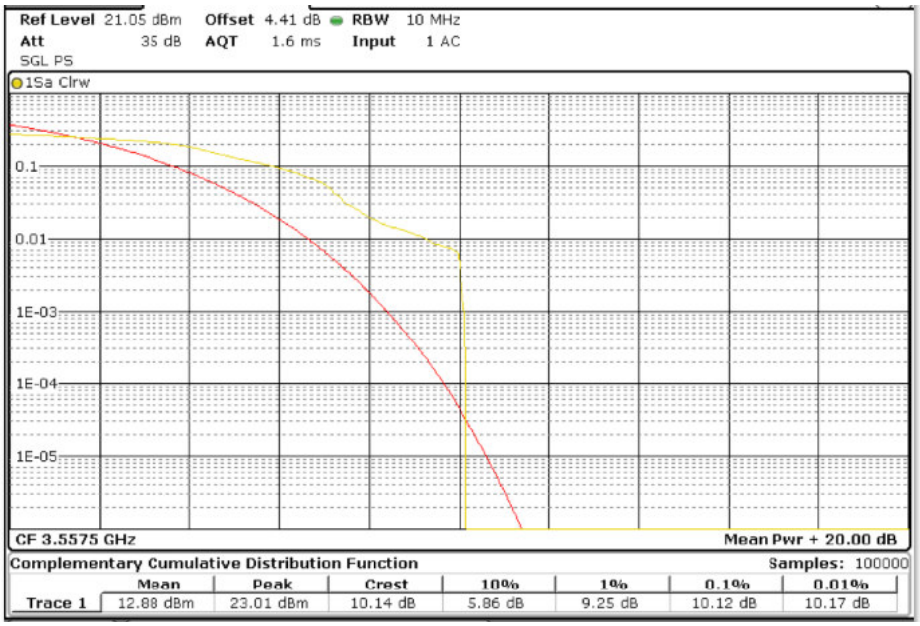
Band 42_BW10M_Middle Channel



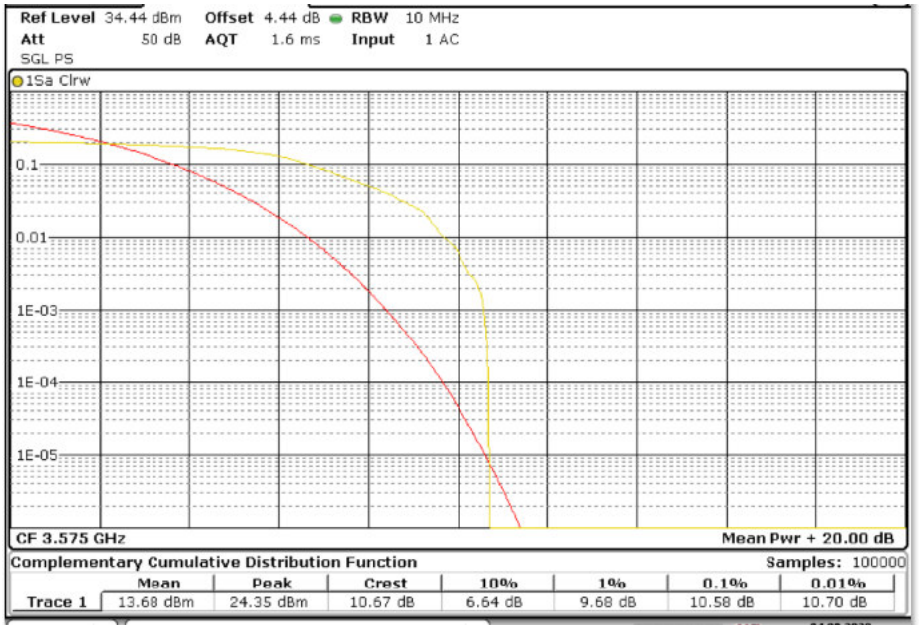
Band 42_BW10M_High Channel



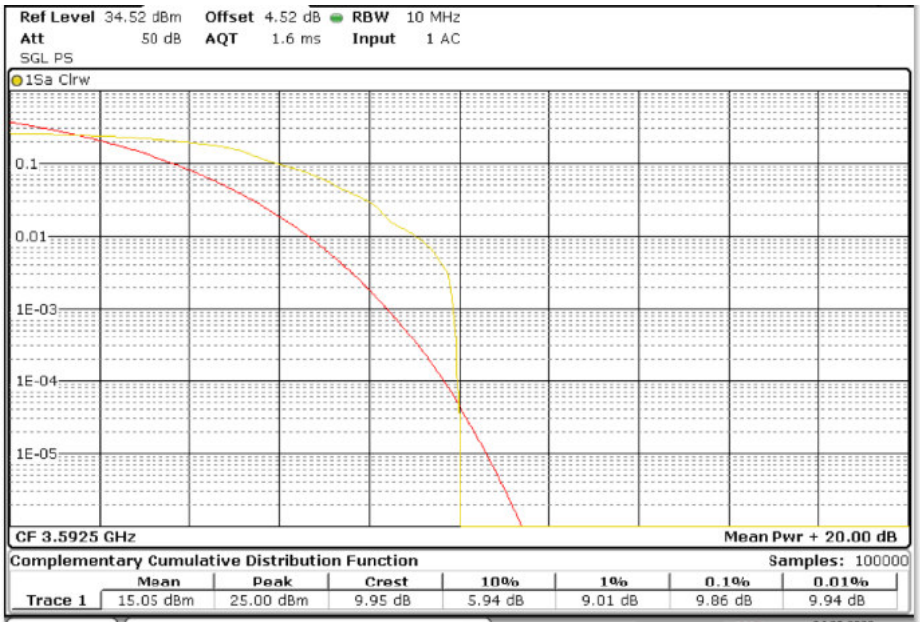
Band 42_BW15M_Low Channel



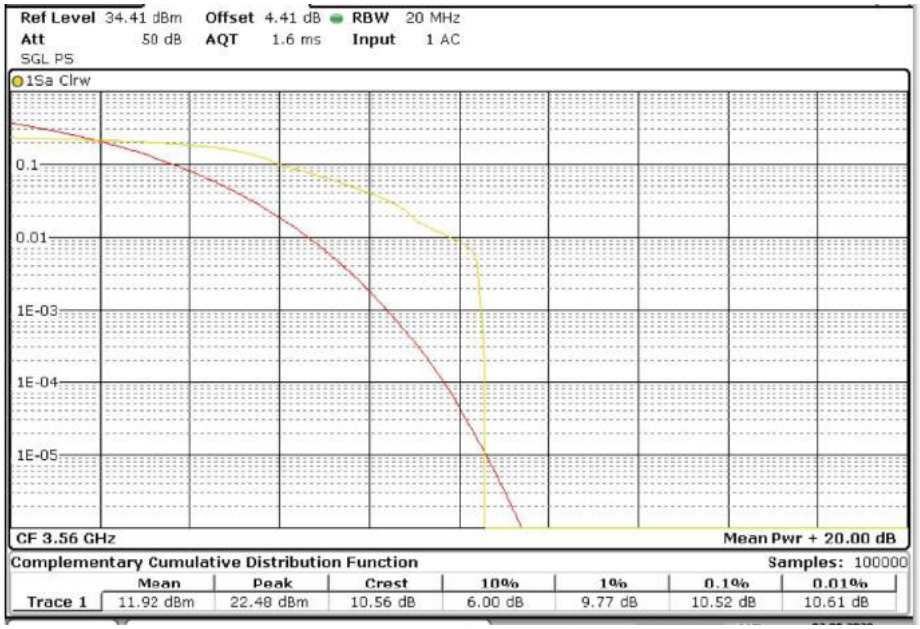
Band 42_BW15M_Middle Channel



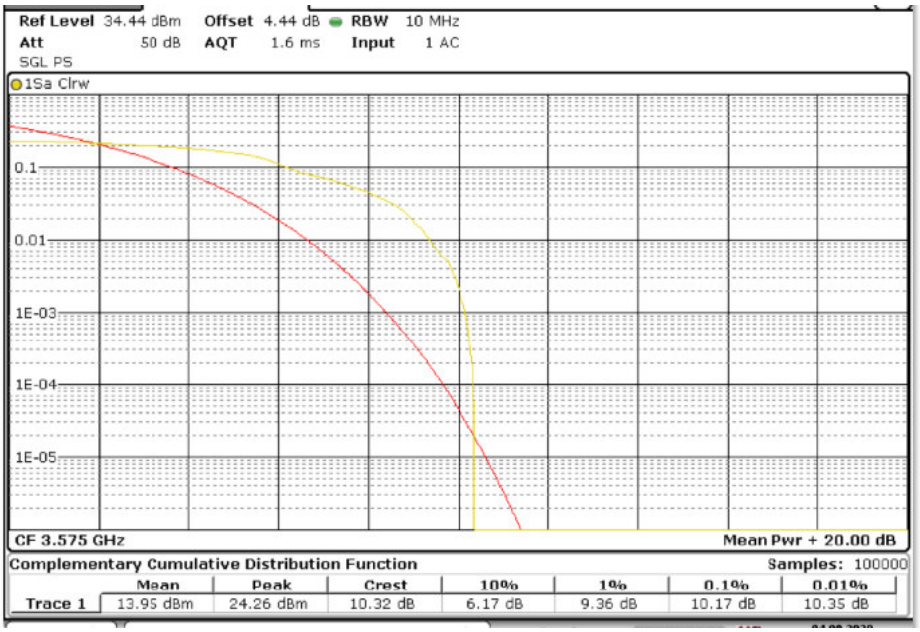
Band 42_BW15M_High Channel



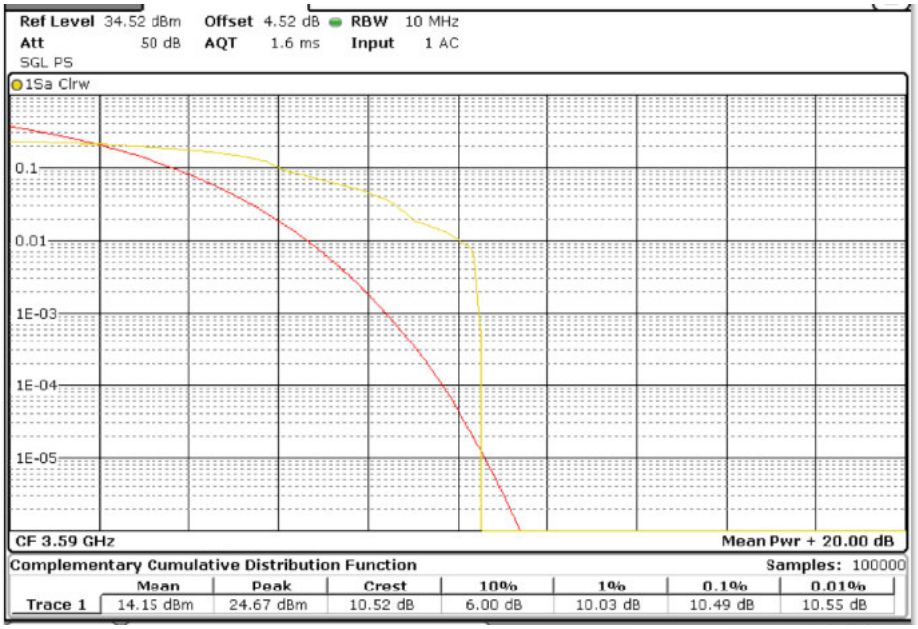
Band 42_BW20M_Low Channel



Band 42_BW20M_Middle Channel



Band 42_BW20M_High Channel



Band 43_BW 5MHz

	Lowest frequency 3602.5 MHz	Middle frequency 3650 MHz	Highest frequency 3697.5 MHz
Peak (dBm)	24.87	25.17	25.09
Mean (dBm)	14.62	15.40	15.75
PAPR at 0.1% probability (dB)	10.23	9.74	9.30

Band 43_BW 10MHz

	Lowest frequency 3605 MHz	Middle frequency 3650 MHz	Highest frequency 3695 MHz
Peak (dBm)	24.40	24.89	21.85
Mean (dBm)	13.94	14.13	12.03
PAPR at 0.1% probability (dB)	10.35	10.67	9.65

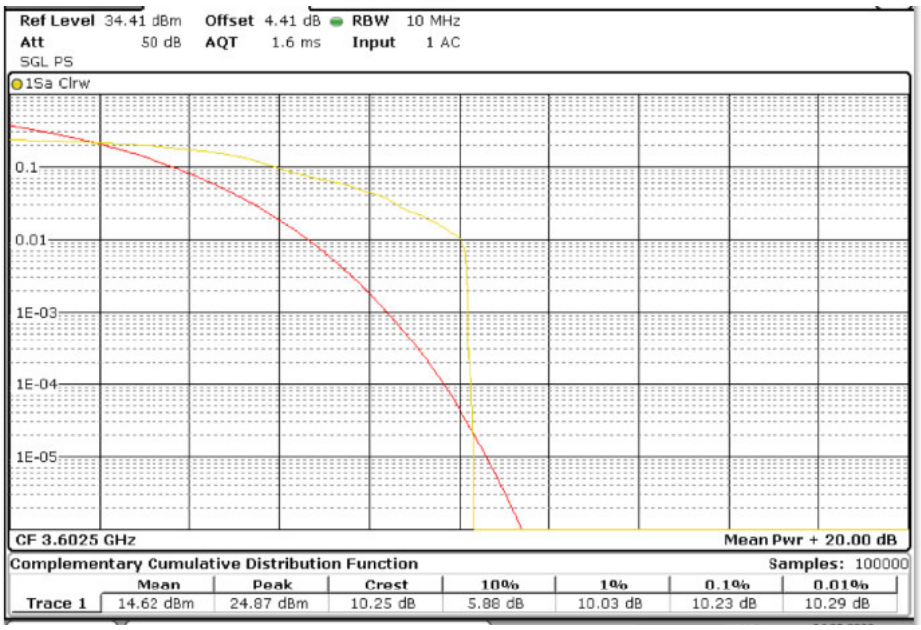
Band 43_BW 15MHz

	Lowest frequency 3607.5 MHz	Middle frequency 3650 MHz	Highest frequency 3692.5 MHz
Peak (dBm)	24.67	24.64	25.17
Mean (dBm)	14.73	13.51	14.77
PAPR at 0.1% probability (dB)	9.88	11.10	10.29

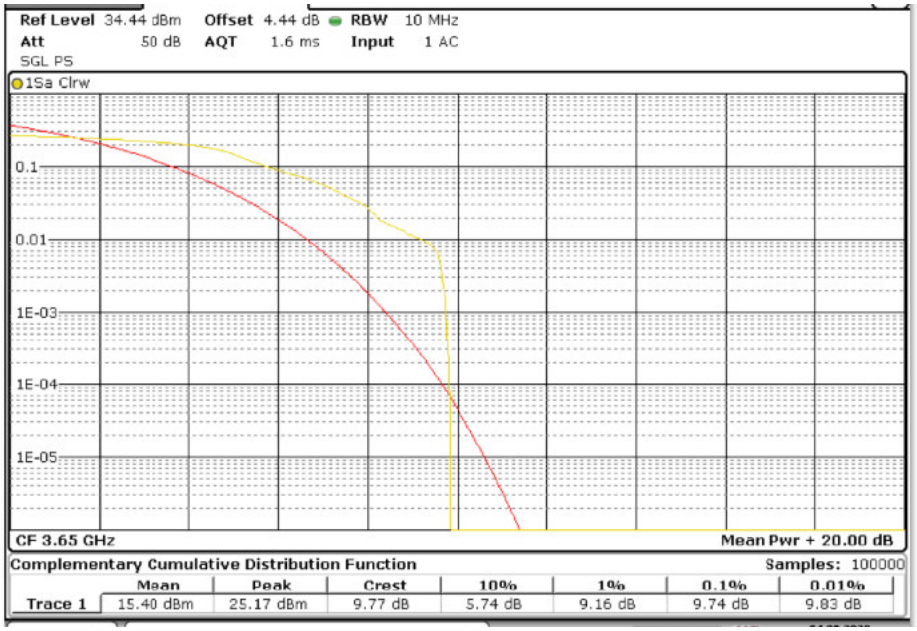
Band 43_BW 20MHz

	Lowest frequency 3610 MHz	Middle frequency 3650 MHz	Highest frequency 3690 MHz
Peak (dBm)	24.89	24.90	19.04
Mean (dBm)	14.10	14.90	8.23
PAPR at 0.1% probability (dB)	10.70	9.91	10.14

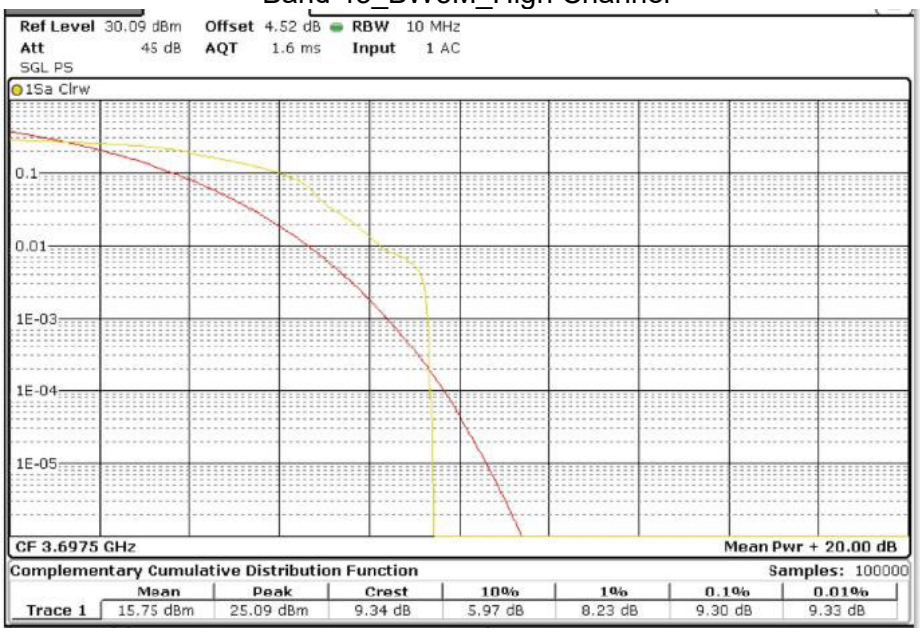
Band 43_BW5M_Low Channel



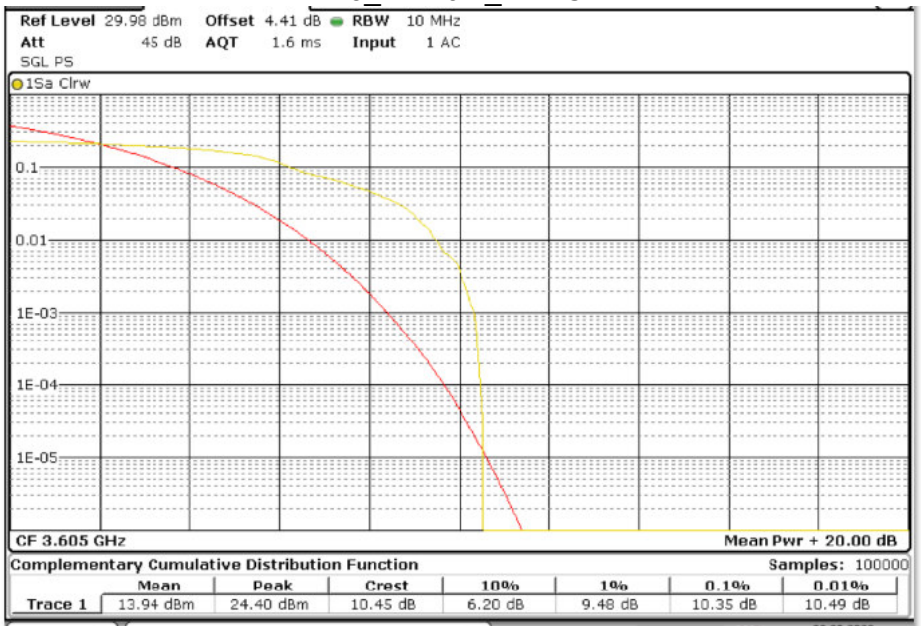
Band 43_BW5M_Middle Channel



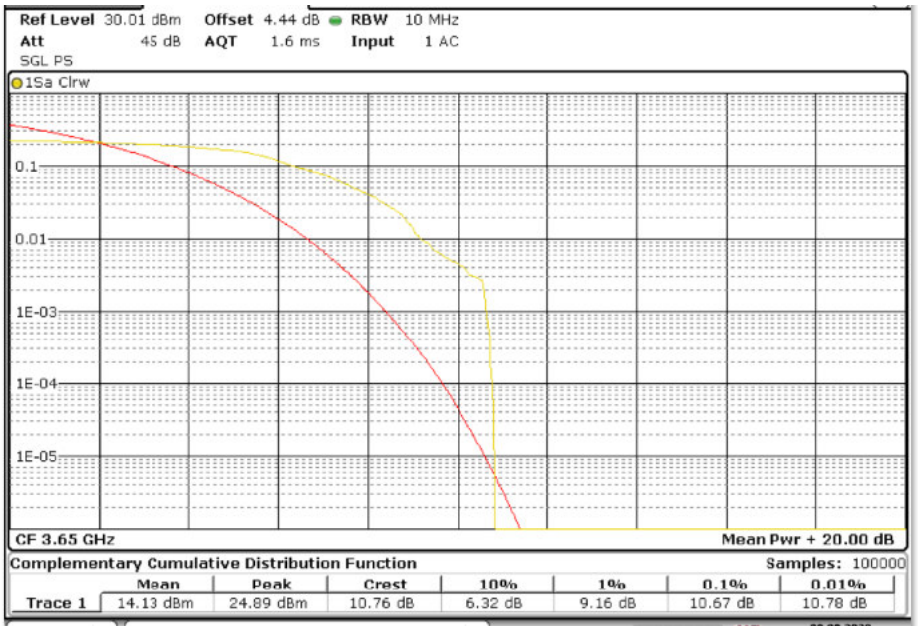
Band 43_BW5M_High Channel



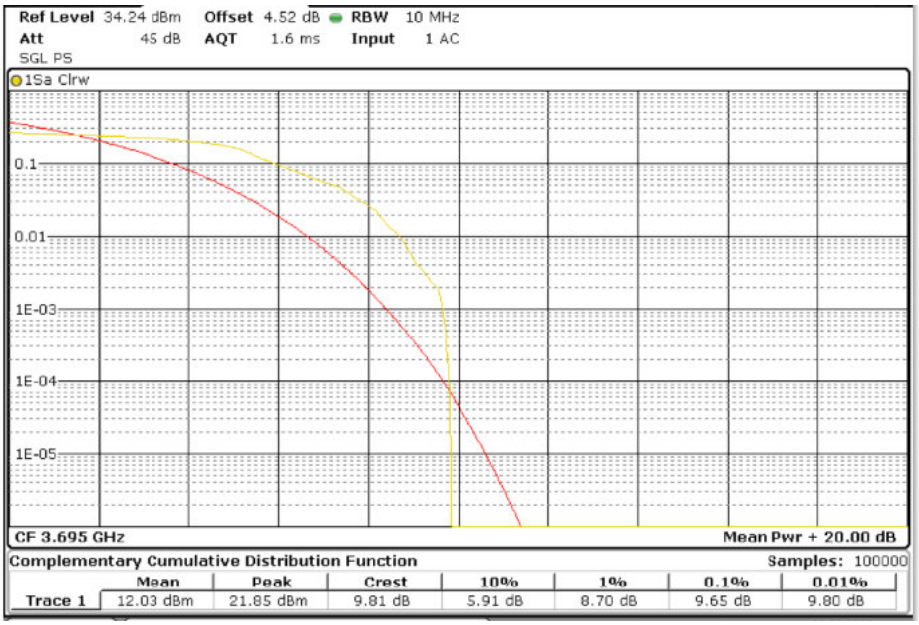
Band 43_BW10M_Low Channel



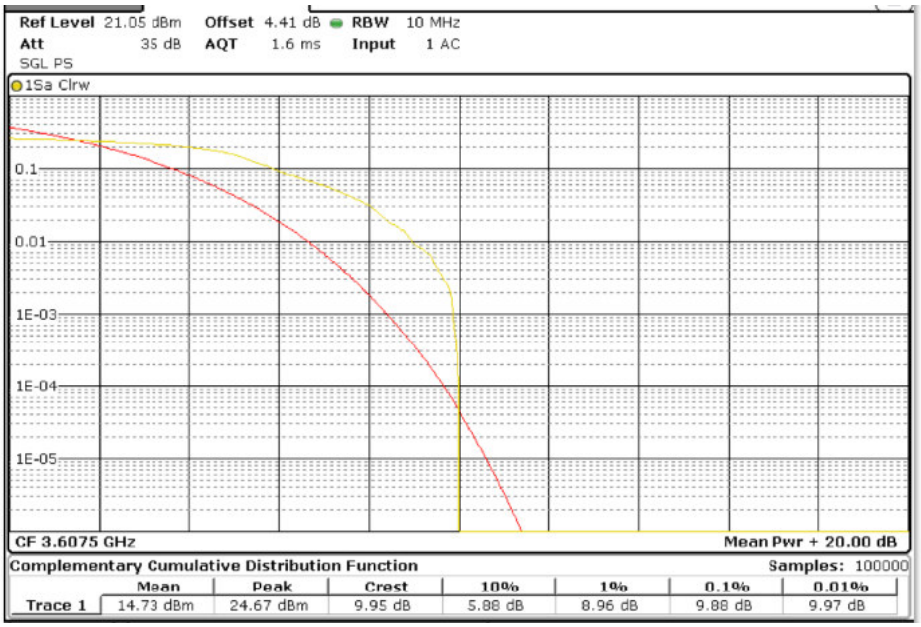
Band 43_BW10M_Middle Channel



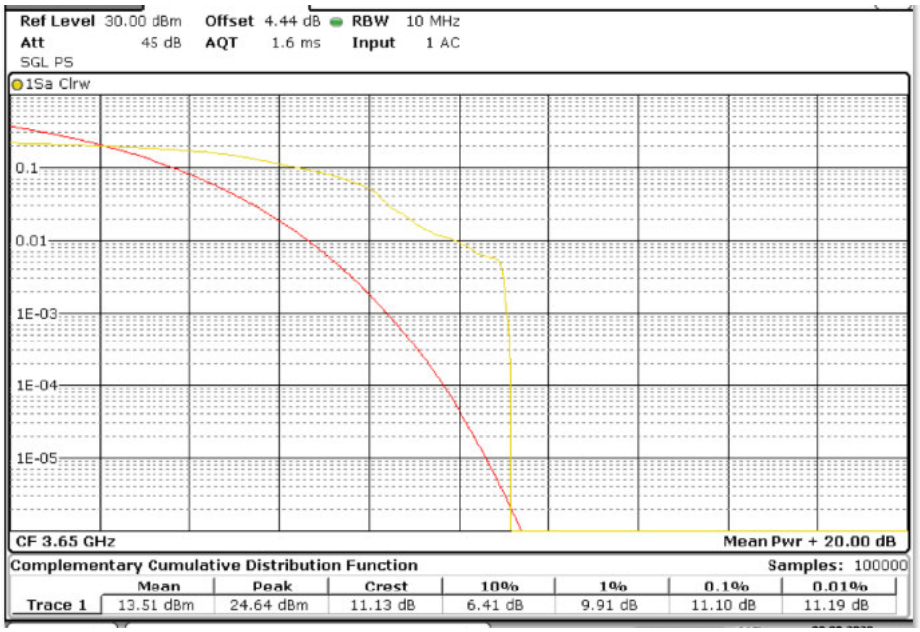
Band 43_BW10M_High Channel



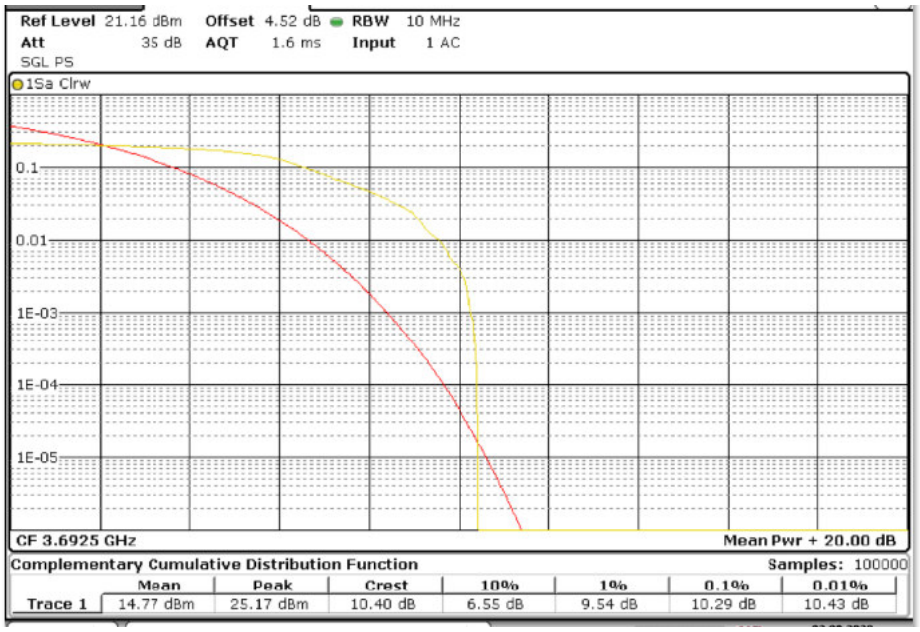
Band 43_BW15M_Low Channel



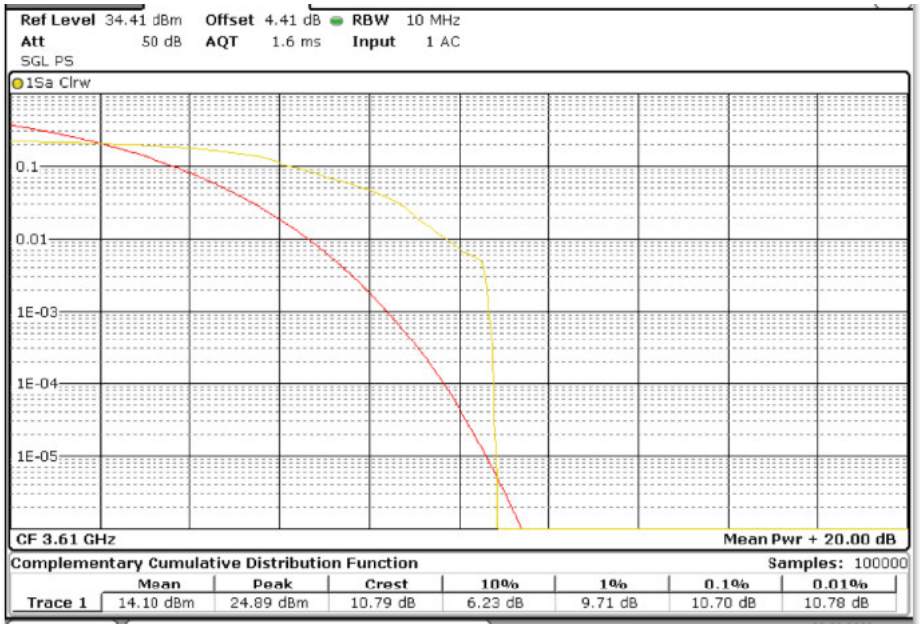
Band 43_BW15M_Middle Channel



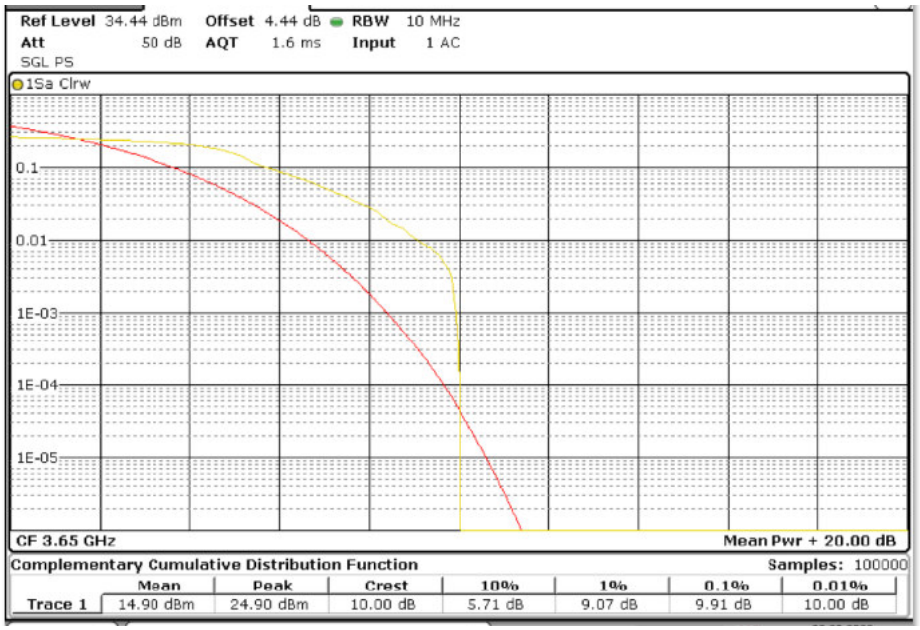
Band 43_BW15M_High Channel



Band 43_BW20M_Low Channel



Band 43_BW20M_Middle Channel



Band 43_BW20M_High Channel