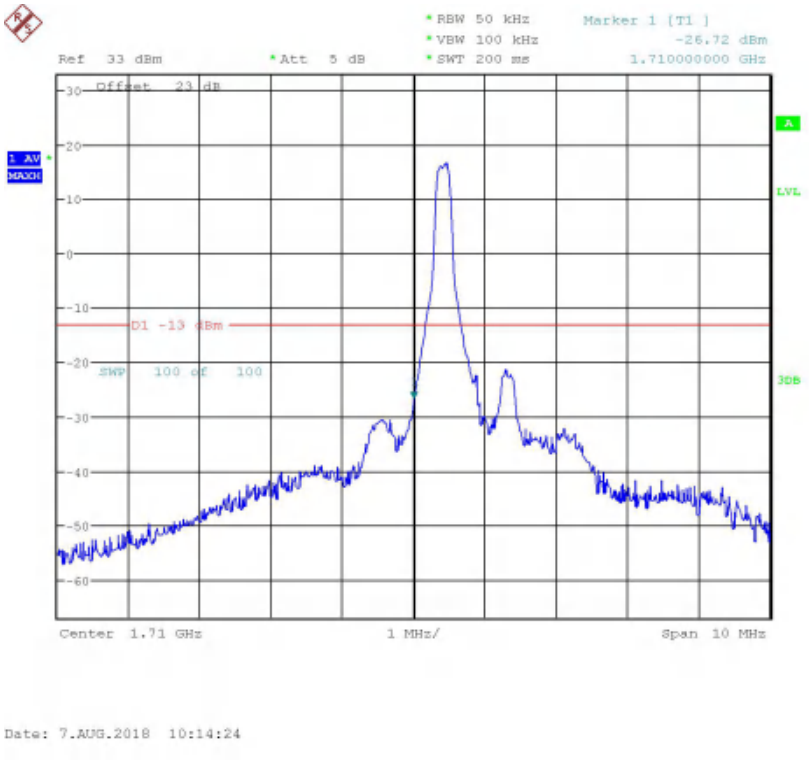
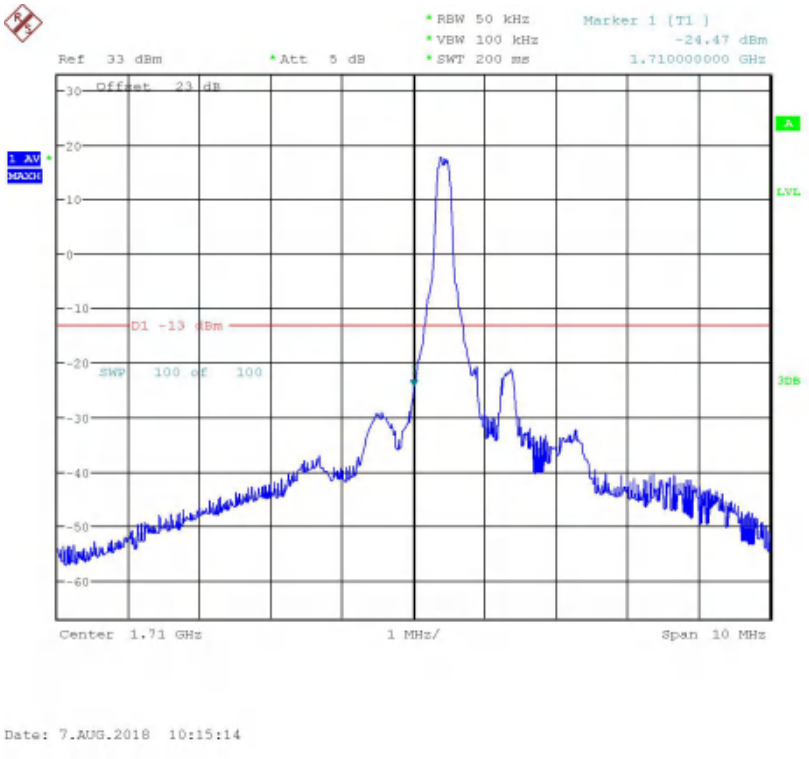
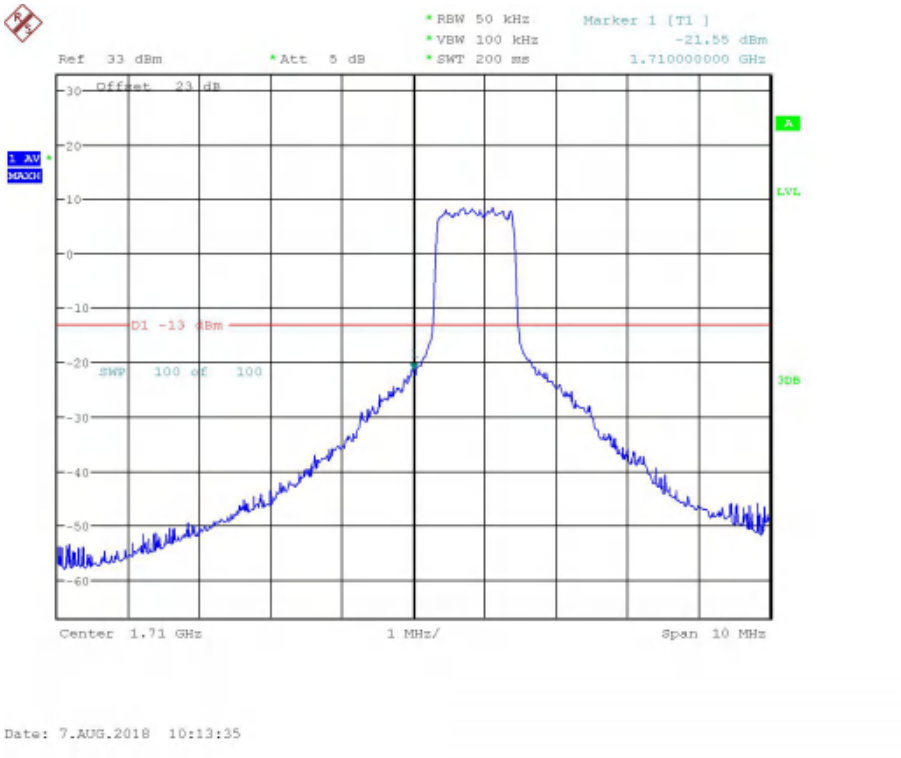


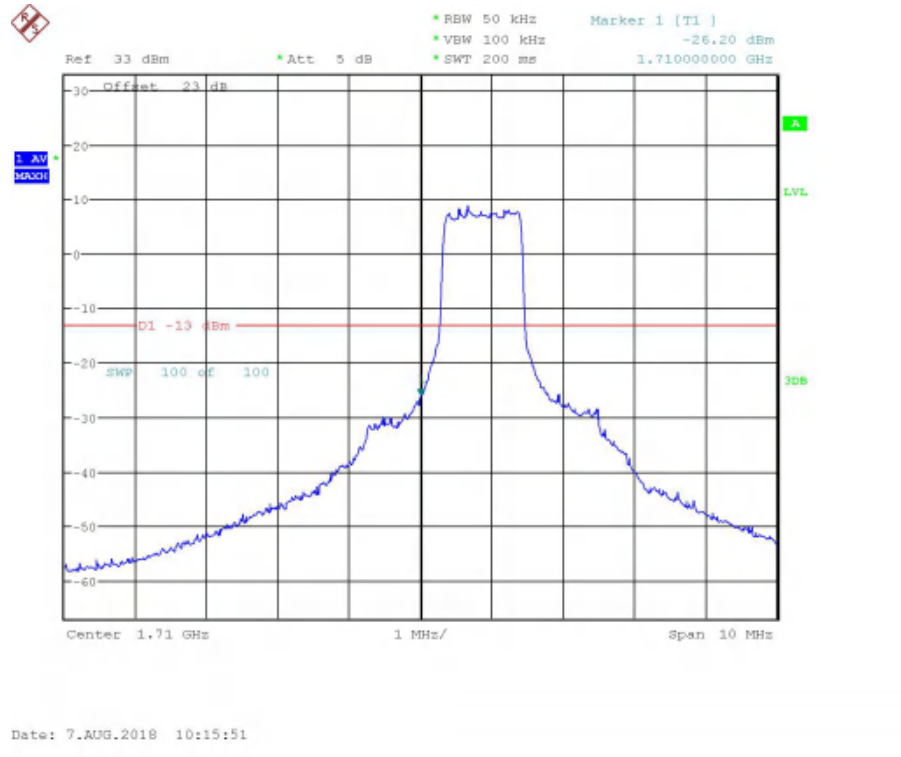
Band4-Low Channel-3MHz Bandwidth-1RB-16QAM



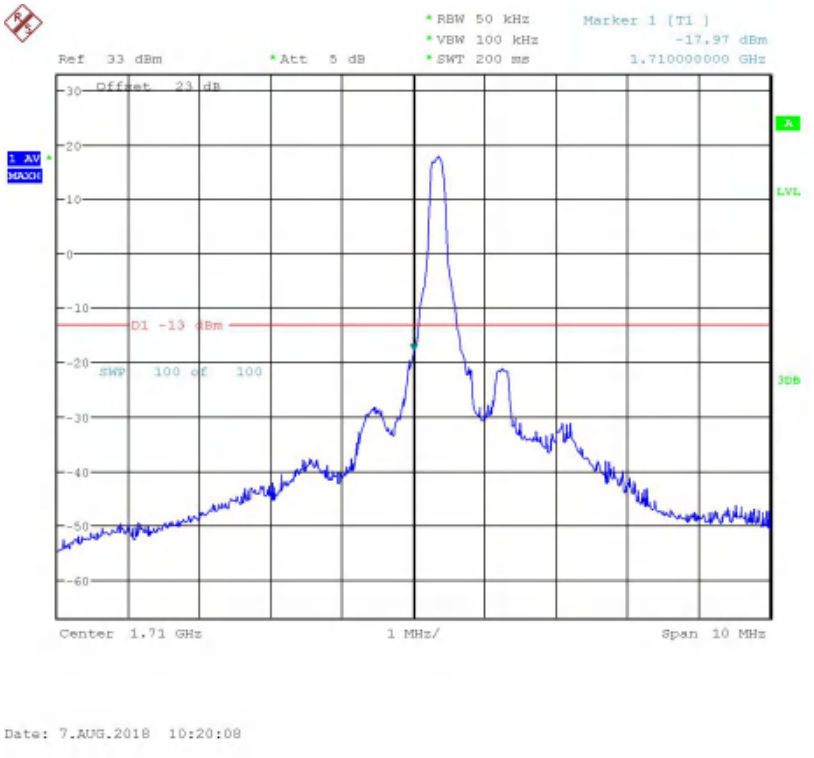
Band4-Low Channel-3MHz Bandwidth-1RB-QPSK



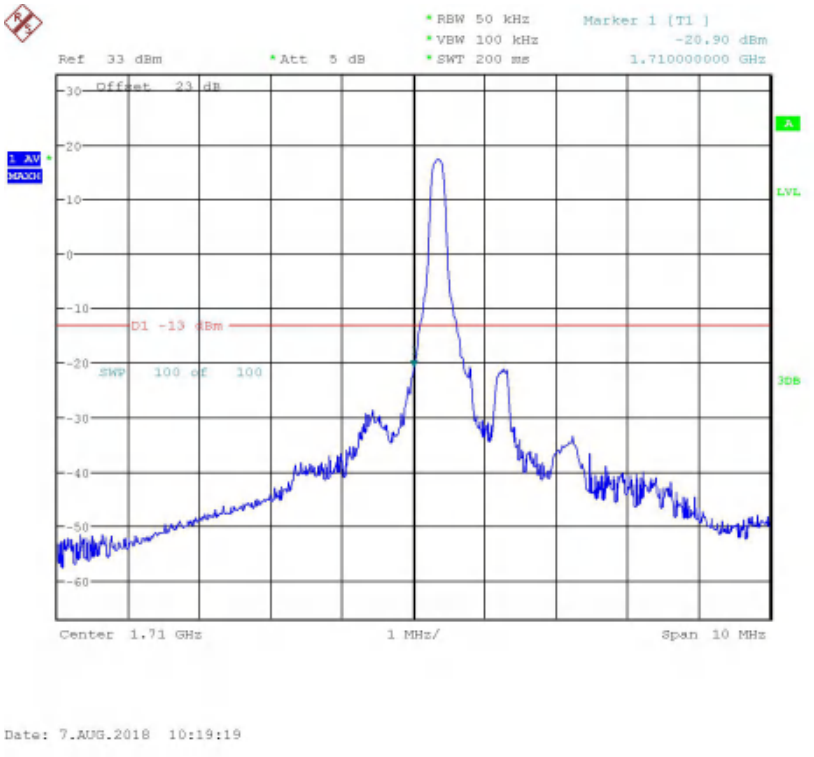
Band4-Low Channel-3MHz Bandwidth-6RB-16QAM



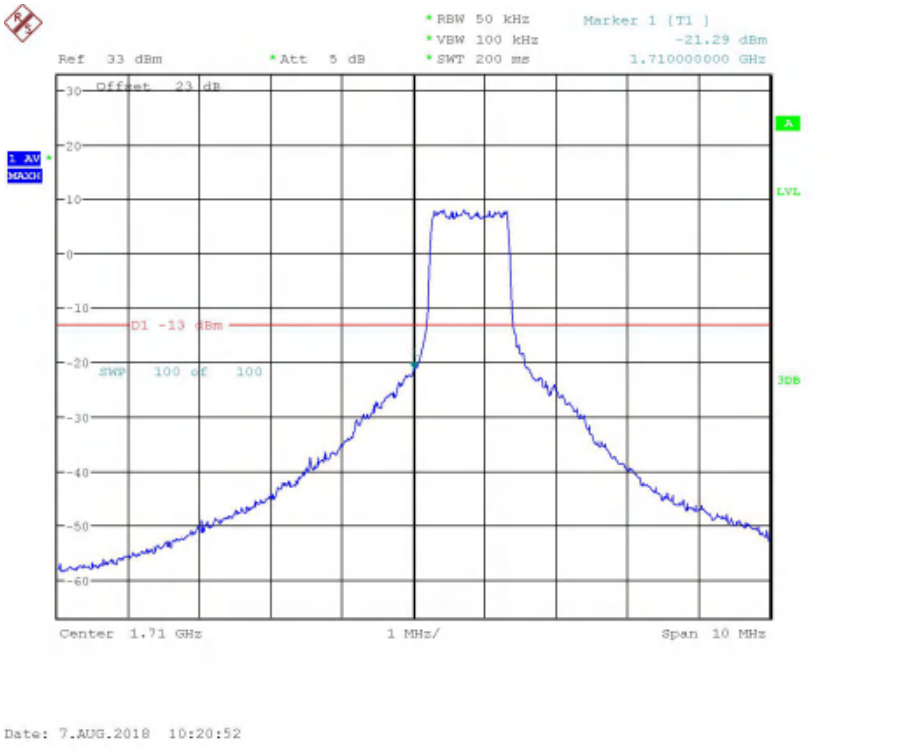
Band4-Low Channel-3MHz Bandwidth-6RB-QPSK



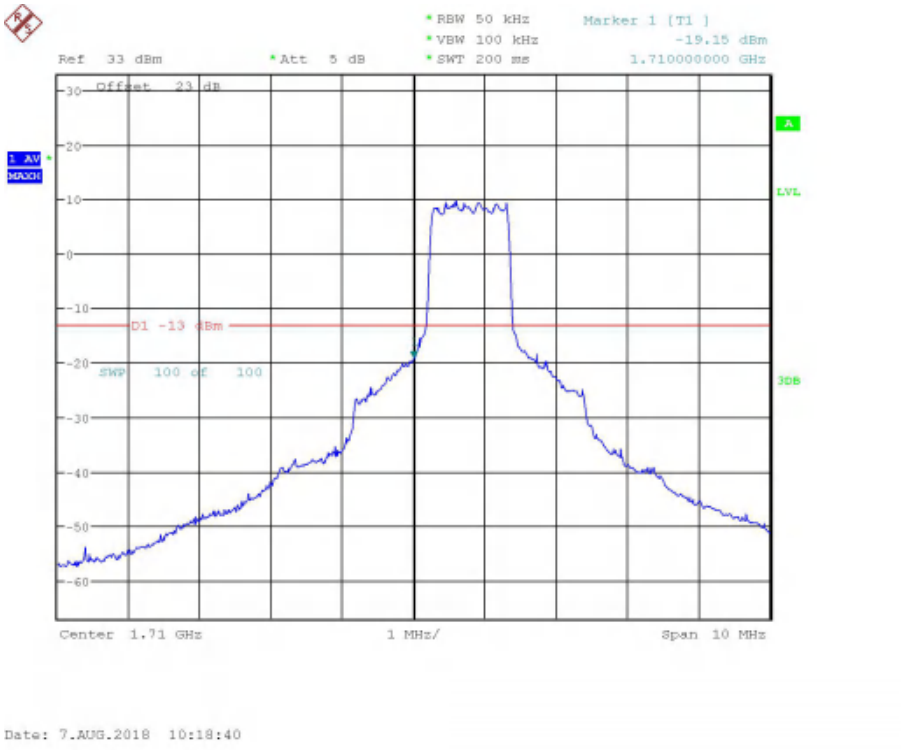
Band4-Low Channel-5MHz Bandwidth-1RB-16QAM



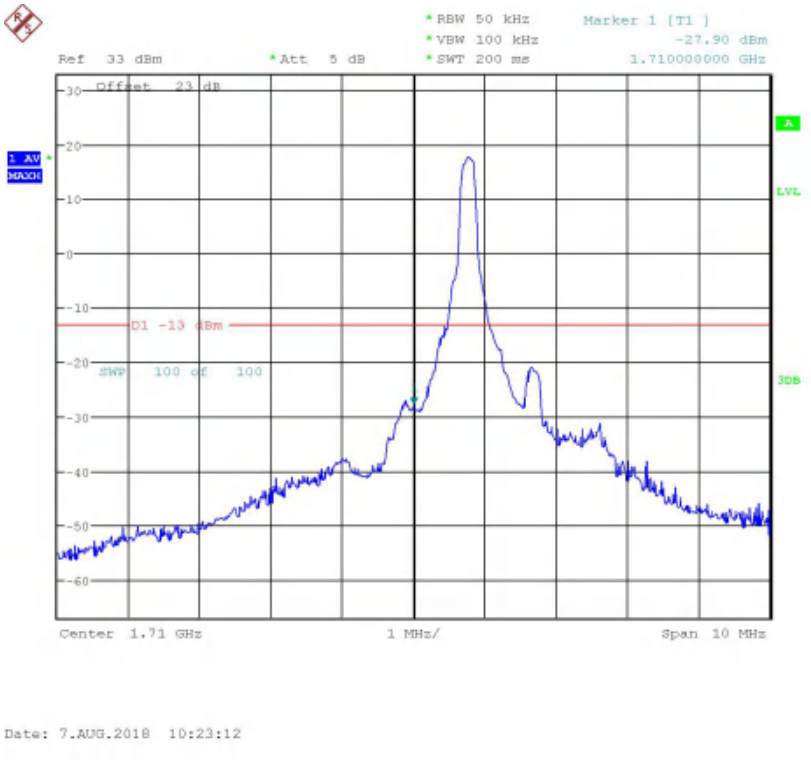
Band4-Low Channel-5MHz Bandwidth-1RB-QPSK



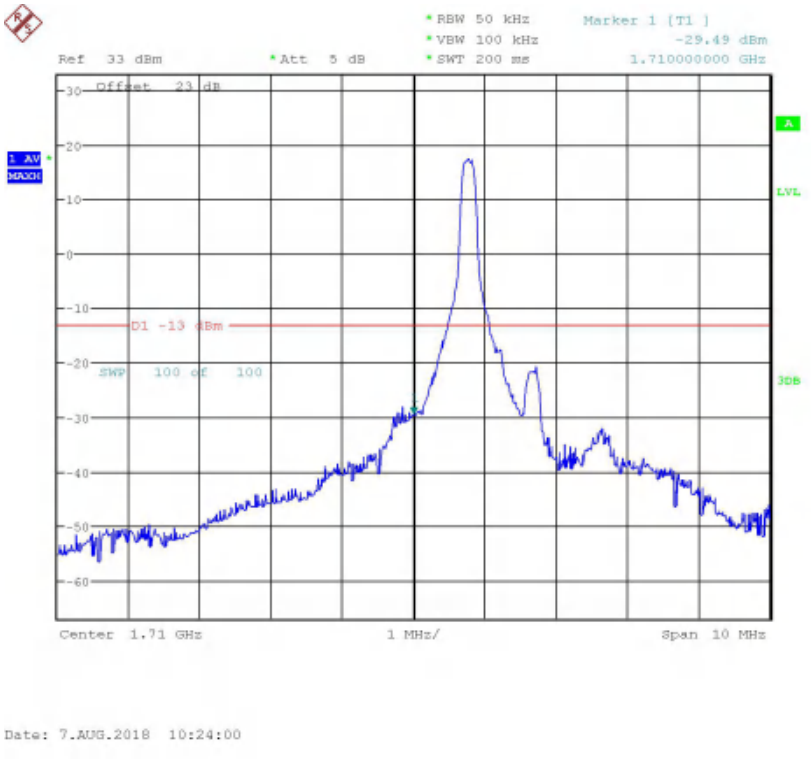
Band4-Low Channel-5MHz Bandwidth-6RB-16QAM



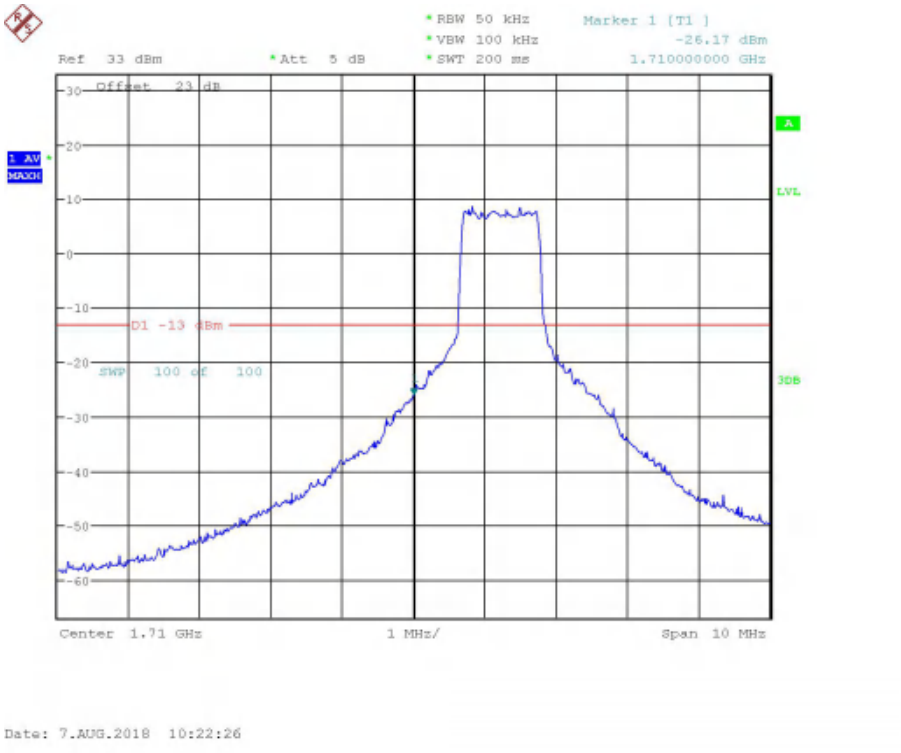
Band4-Low Channel-5MHz Bandwidth-6RB-QPSK



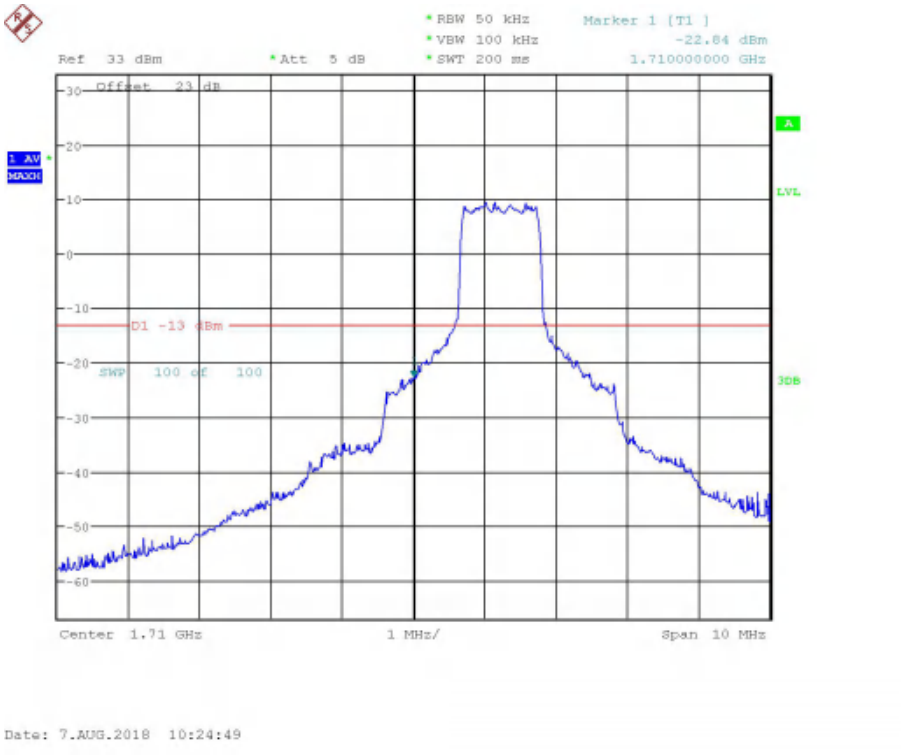
Band4-Low Channel-10MHz Bandwidth-1RB-16QAM



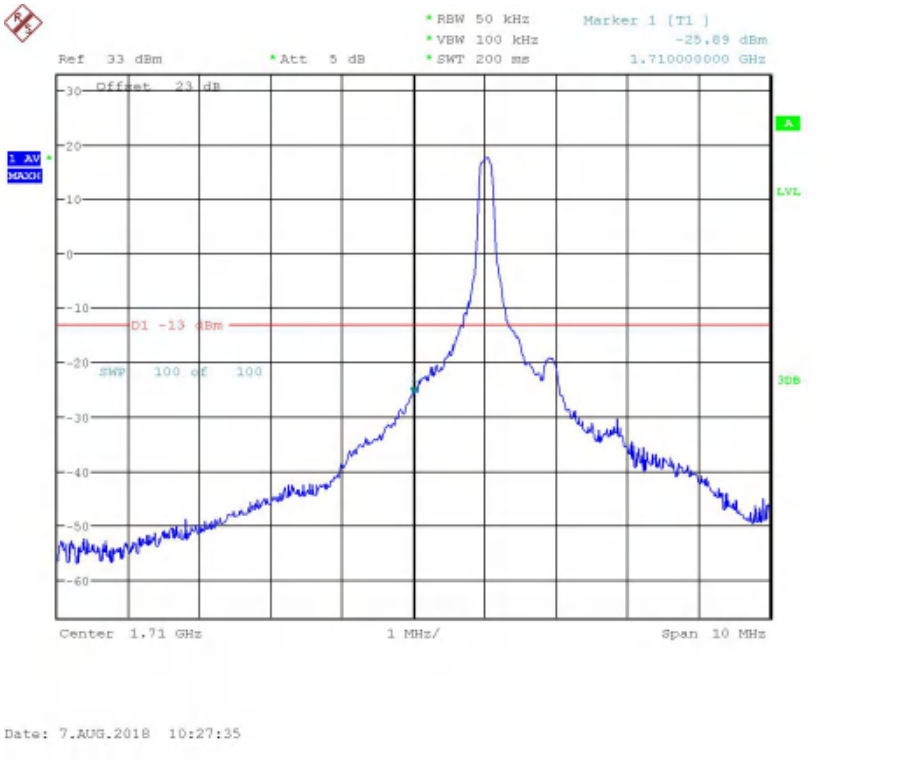
Band4-Low Channel-10MHz Bandwidth-1RB-QPSK



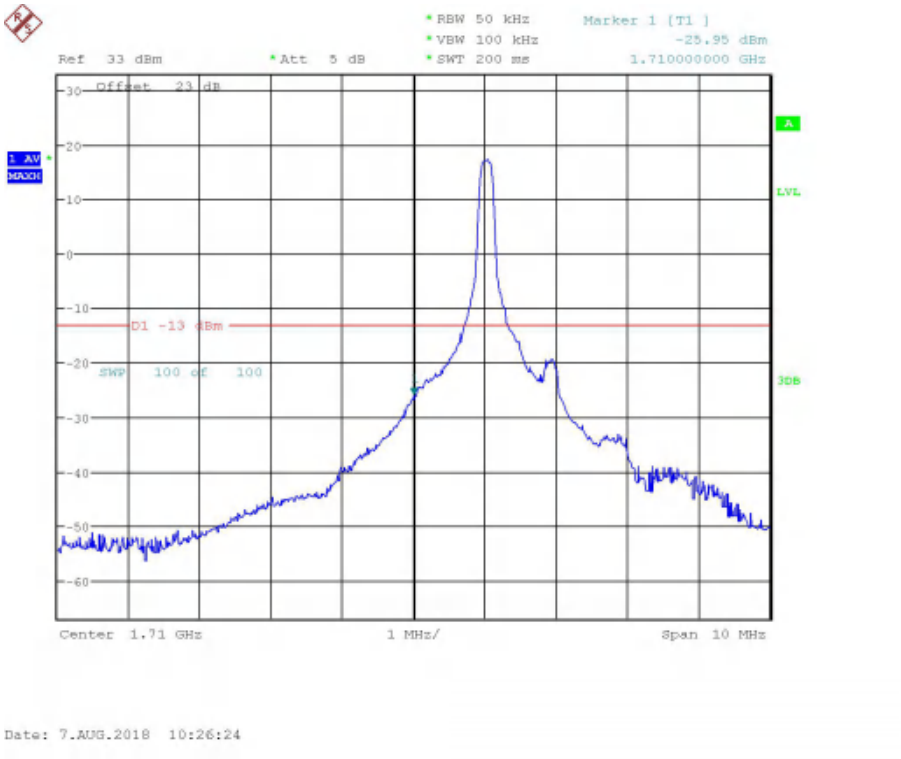
Band4-Low Channel-10MHz Bandwidth-6RB-16QAM



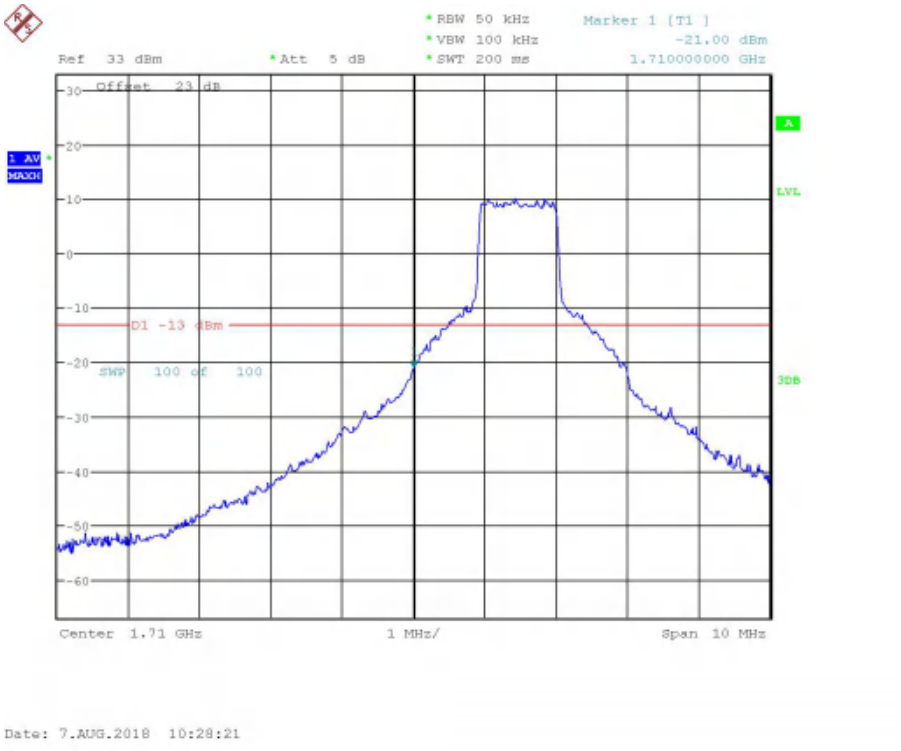
Band4-Low Channel-10MHz Bandwidth-6RB-QPSK



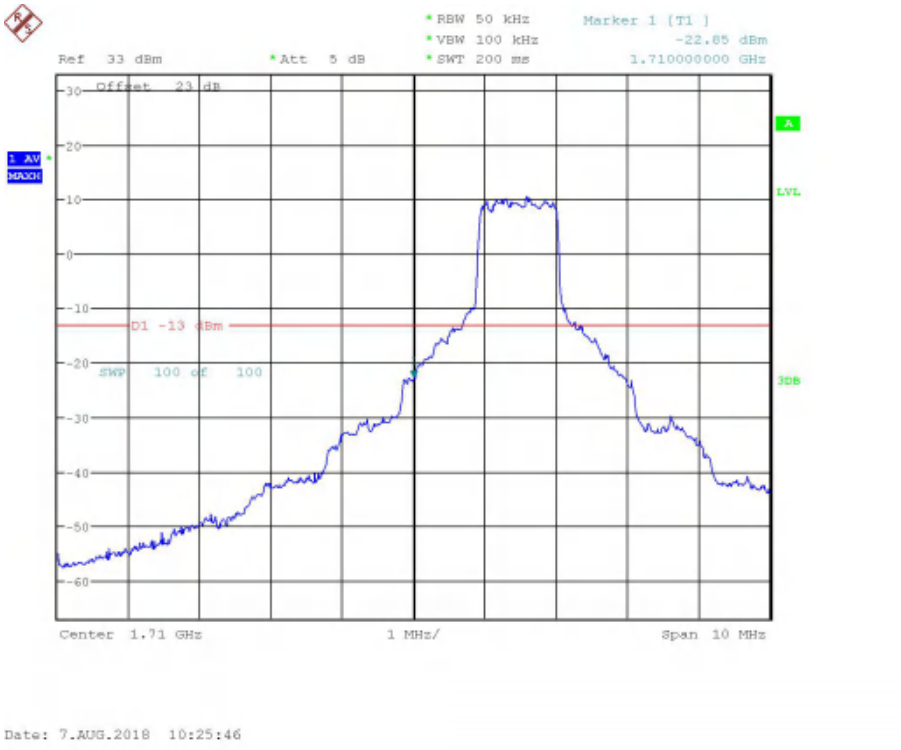
Band4-Low Channel-15MHz Bandwidth-1RB-16QAM



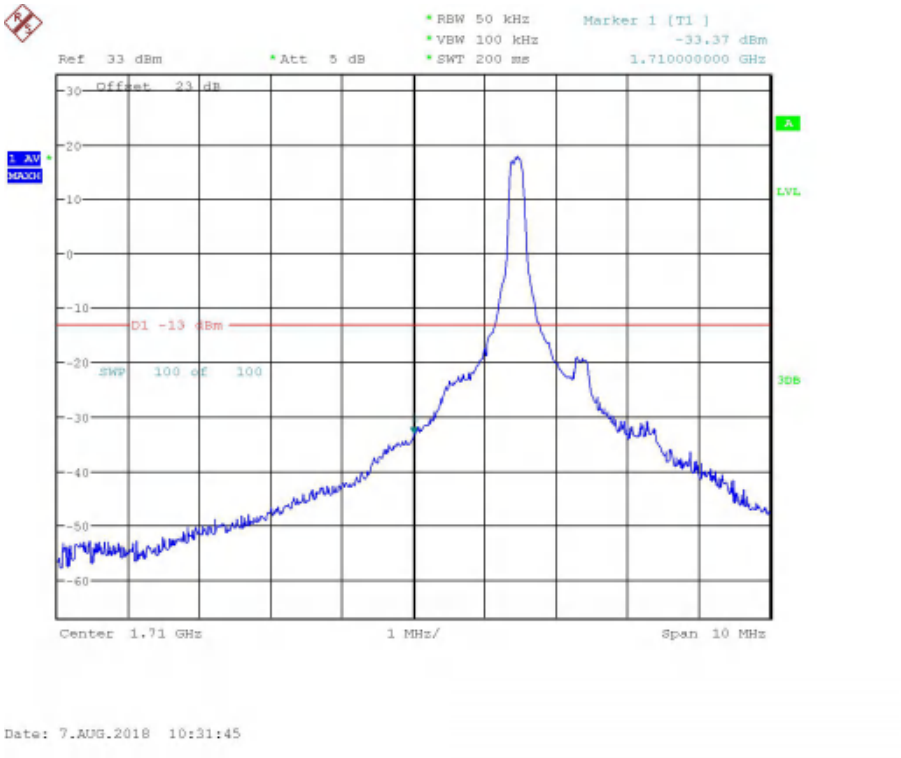
Band4-Low Channel-15MHz Bandwidth-1RB-QPSK



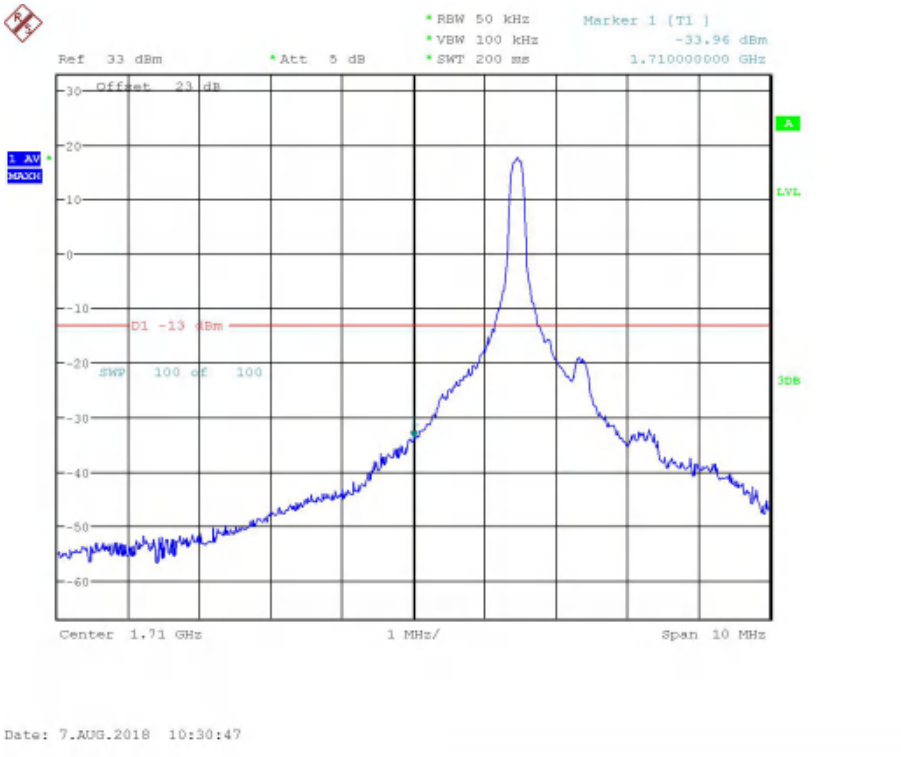
Band4-Low Channel-15MHz Bandwidth-6RB-16QAM



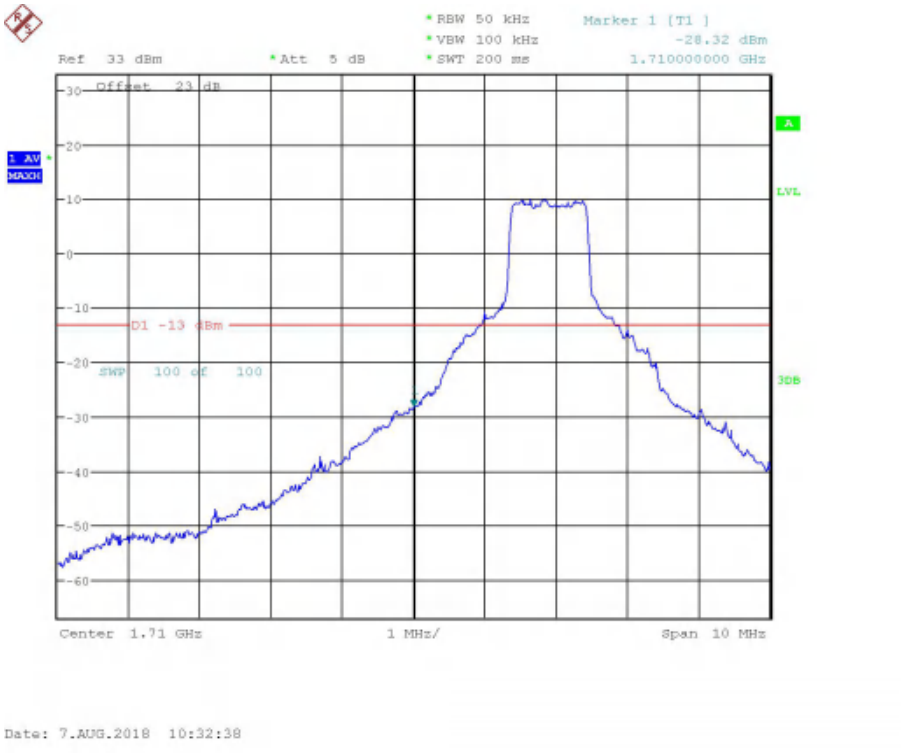
Band4-Low Channel-15MHz Bandwidth-6RB-QPSK



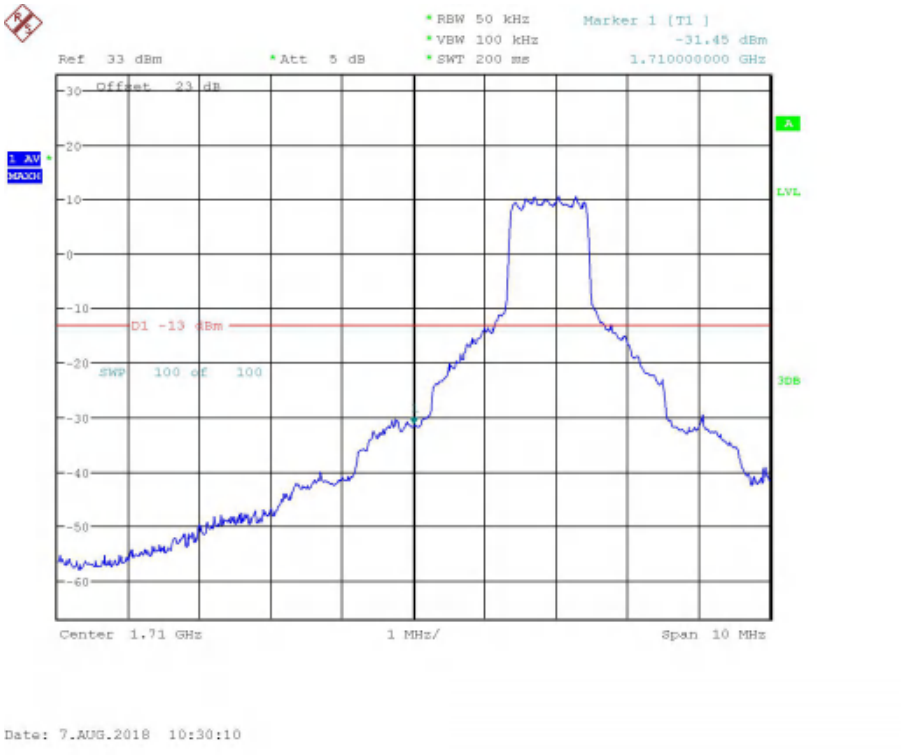
Band4-Low Channel-20MHz Bandwidth-1RB-16QAM



Band4-Low Channel-20MHz Bandwidth-1RB-QPSK

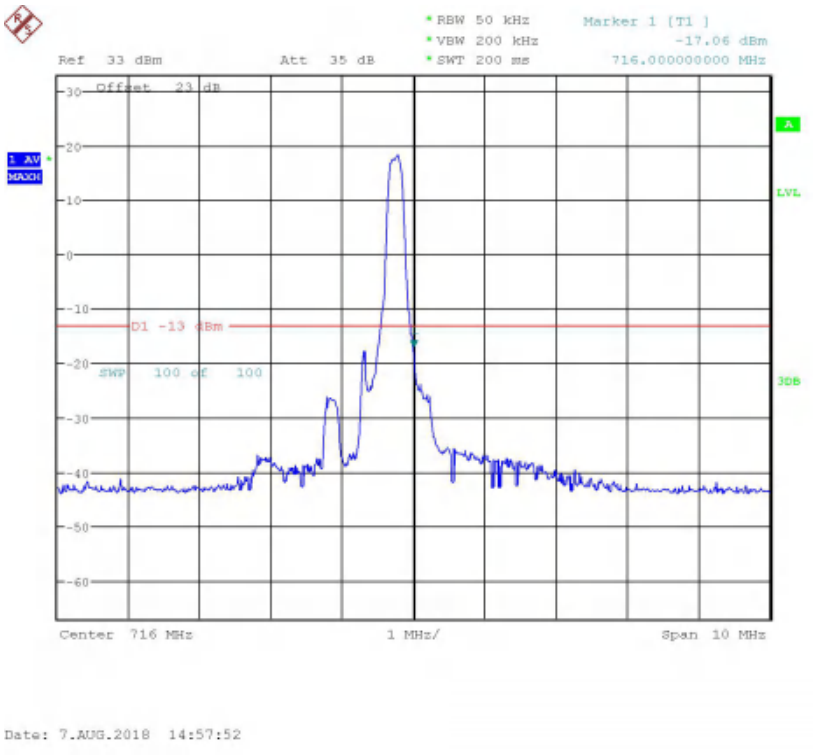


Band4-Low Channel-20MHz Bandwidth-6RB-16QAM

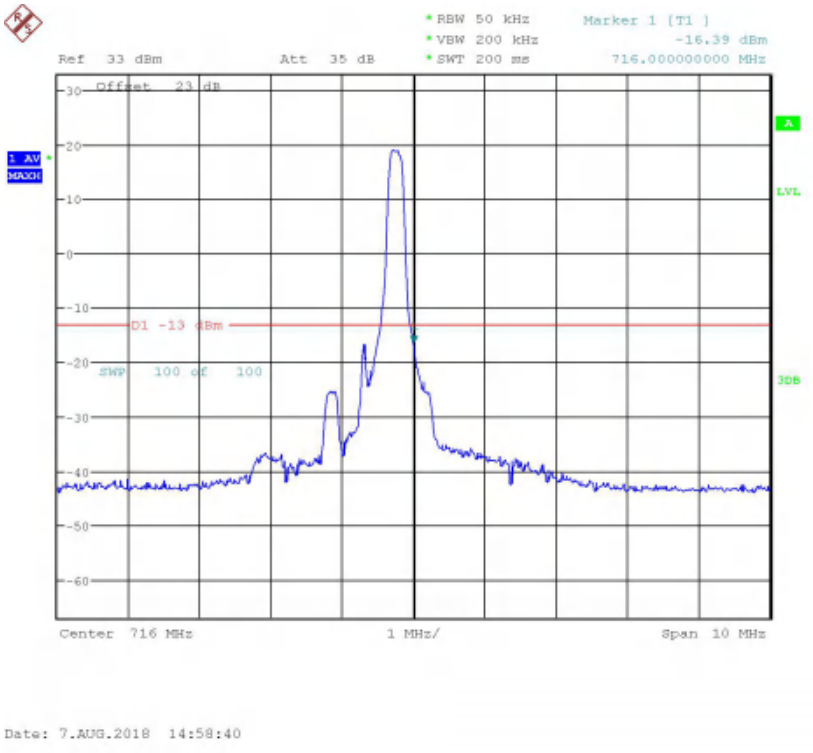


Band4-Low Channel-20MHz Bandwidth-6RB-QPSK

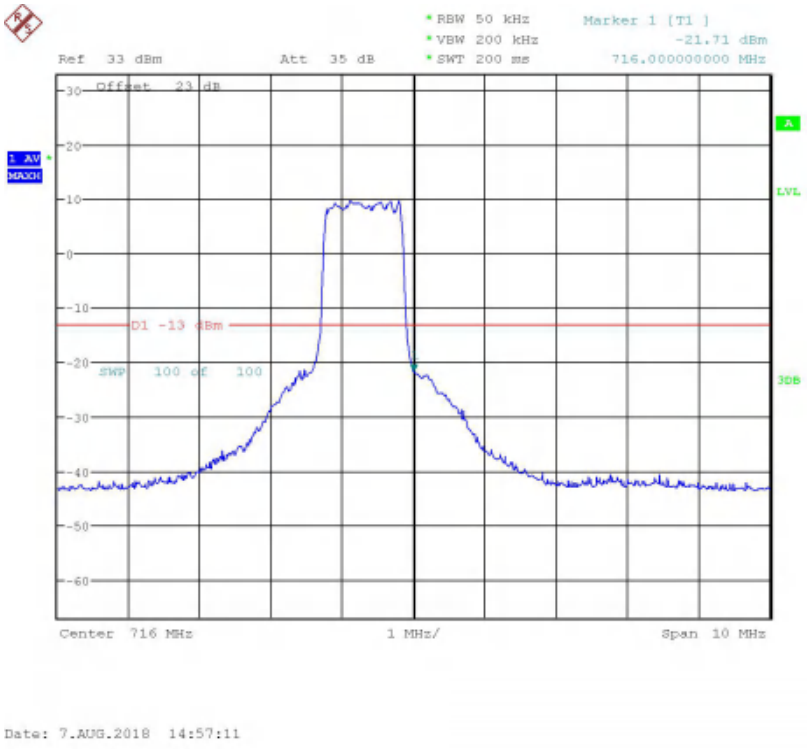
5.5.10 CAT-M Band12 Edge Results



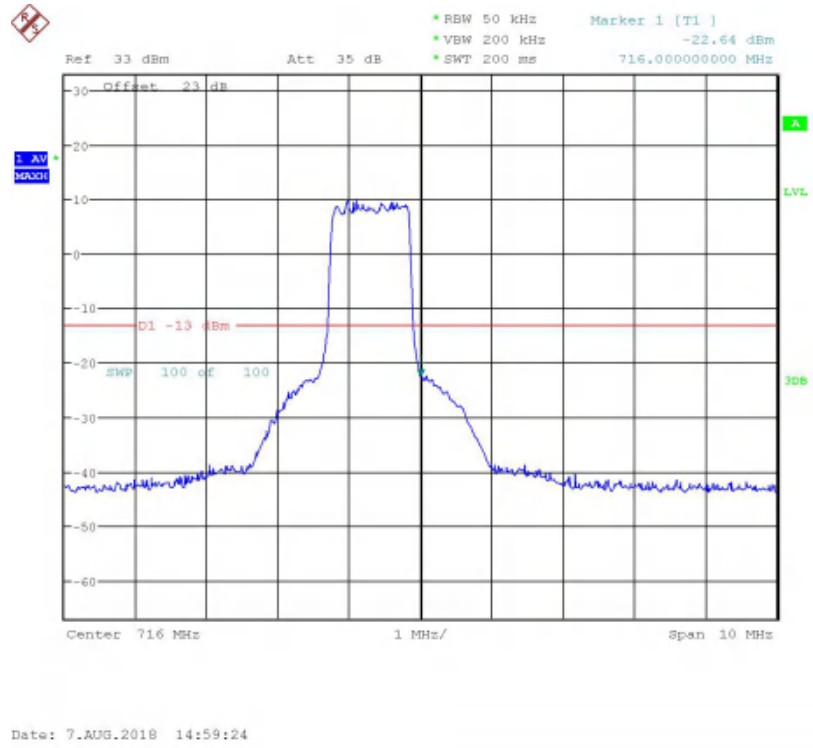
Band12-High Channel-1.4MHz Bandwidth-1RB-16QAM



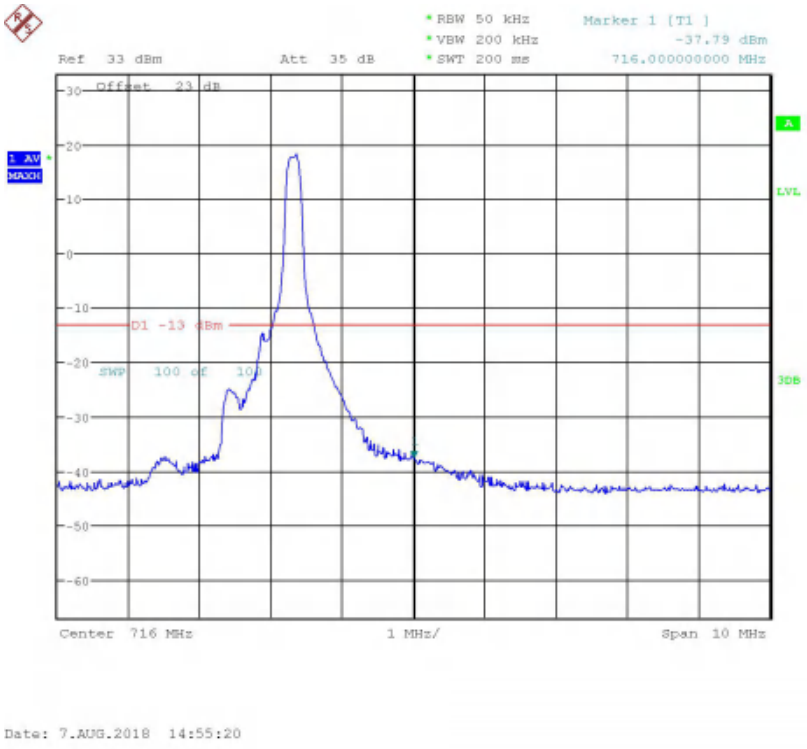
Band12-High Channel-1.4MHz Bandwidth-1RB-QPSK



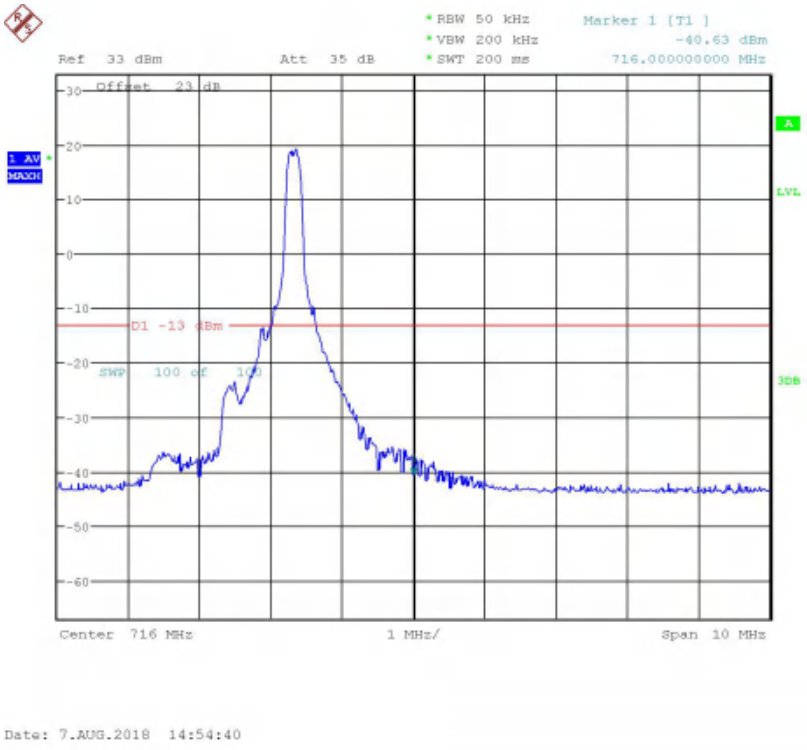
Band12-High Channel-1.4MHz Bandwidth-6RB-16QAM



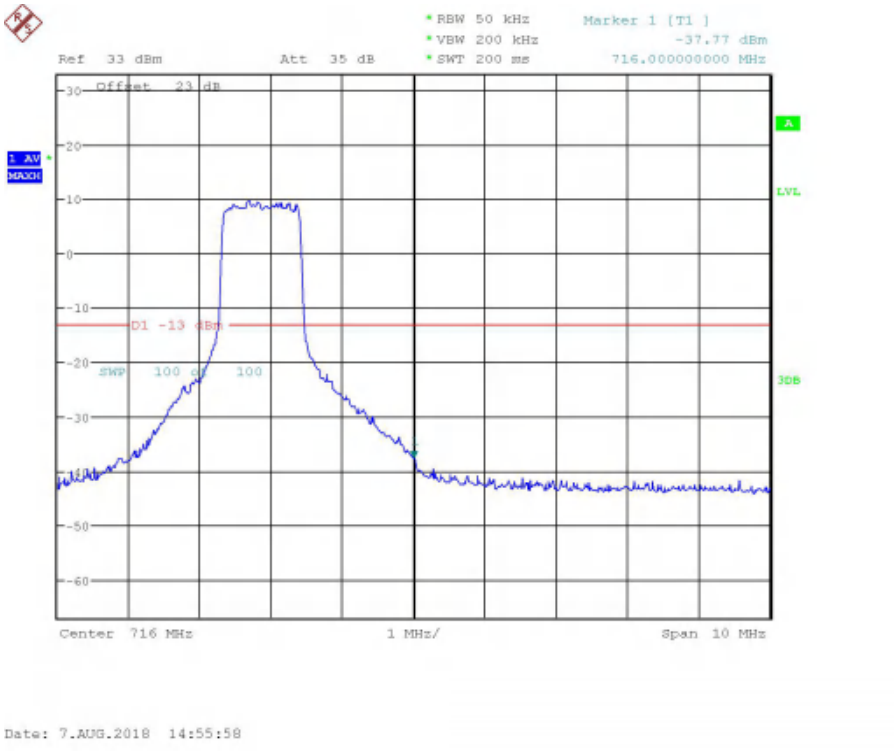
Band12-High Channel-1.4MHz Bandwidth-6RB-QPSK



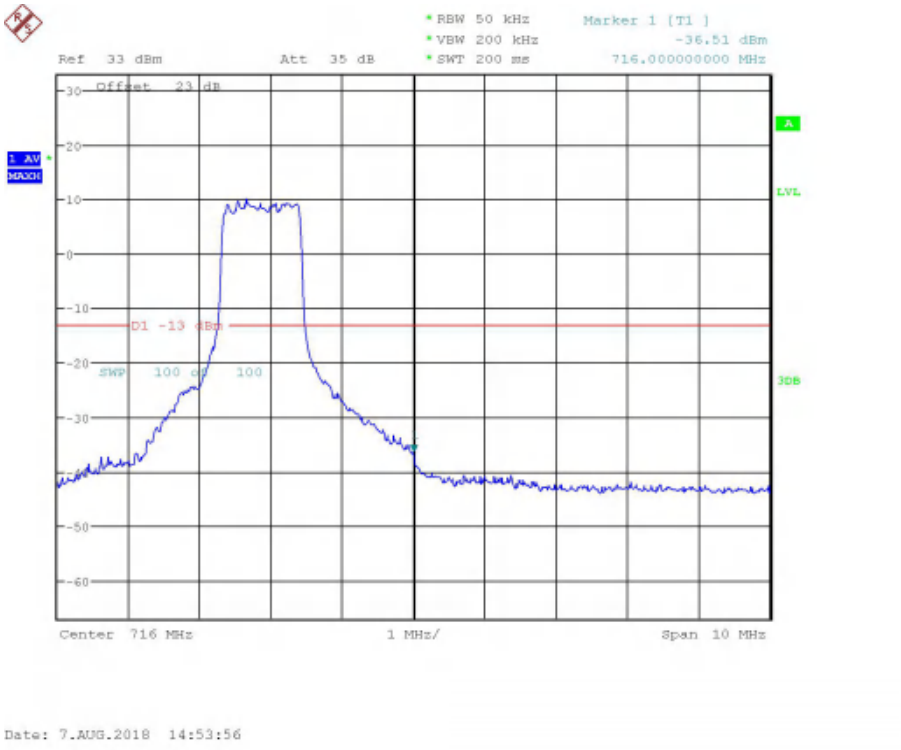
Band12-High Channel-3MHz Bandwidth-1RB-16QAM



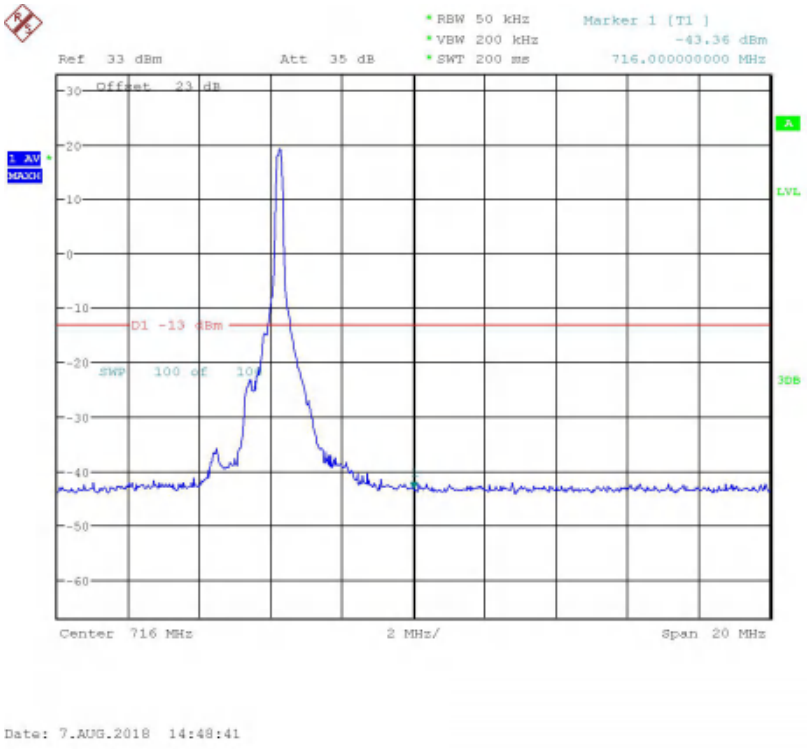
Band12-High Channel-3MHz Bandwidth-1RB-QPSK



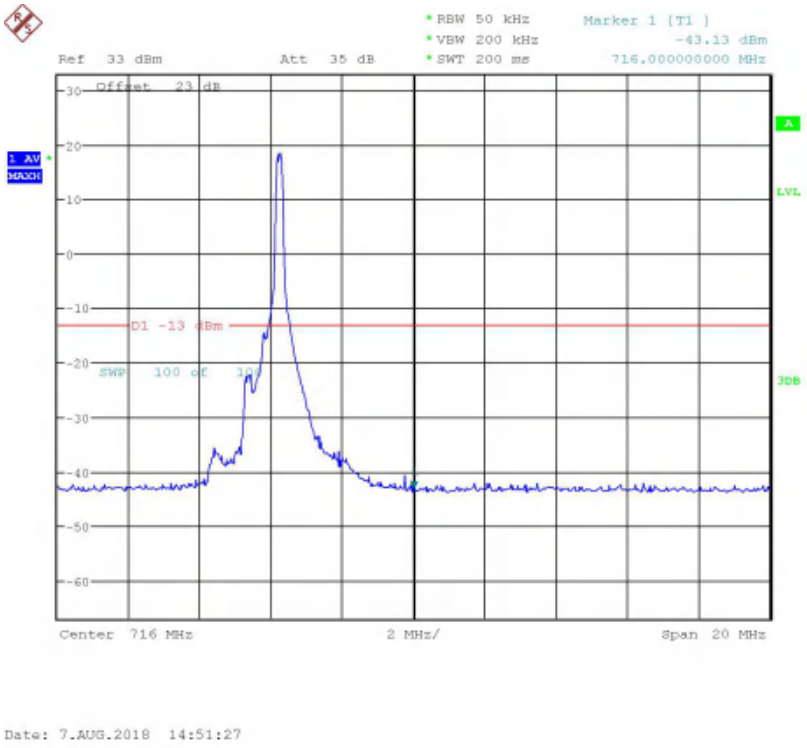
Band12-High Channel-3MHz Bandwidth-6RB-16QAM



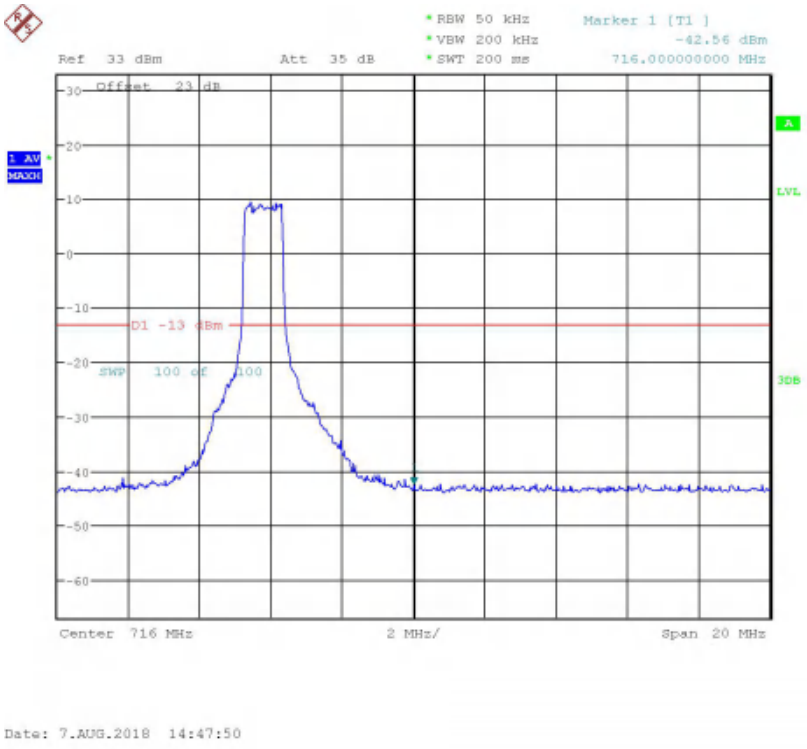
Band12-High Channel-3MHz Bandwidth-6RB-QPSK



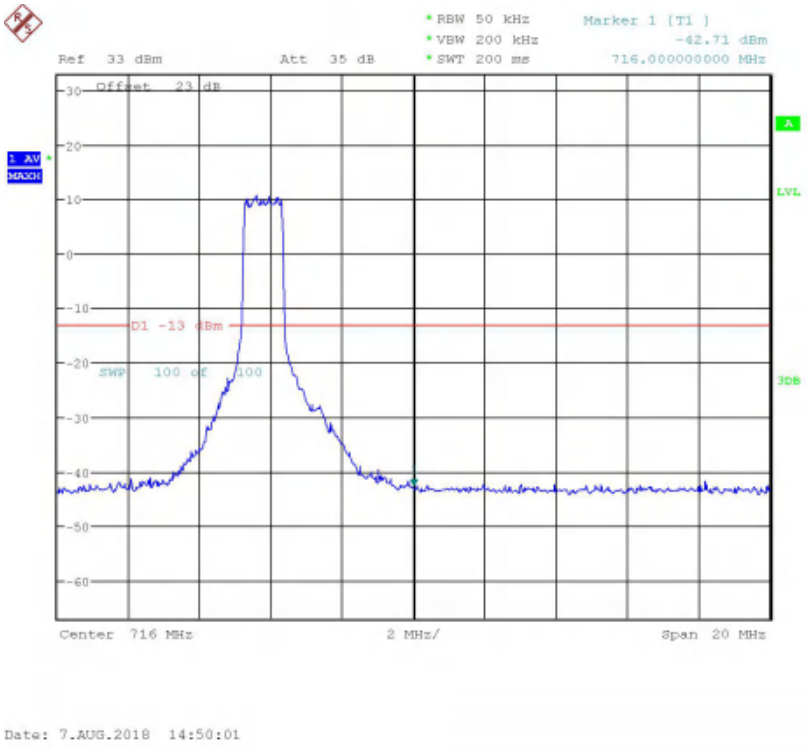
Band12-High Channel-5MHz Bandwidth-1RB-16QAM



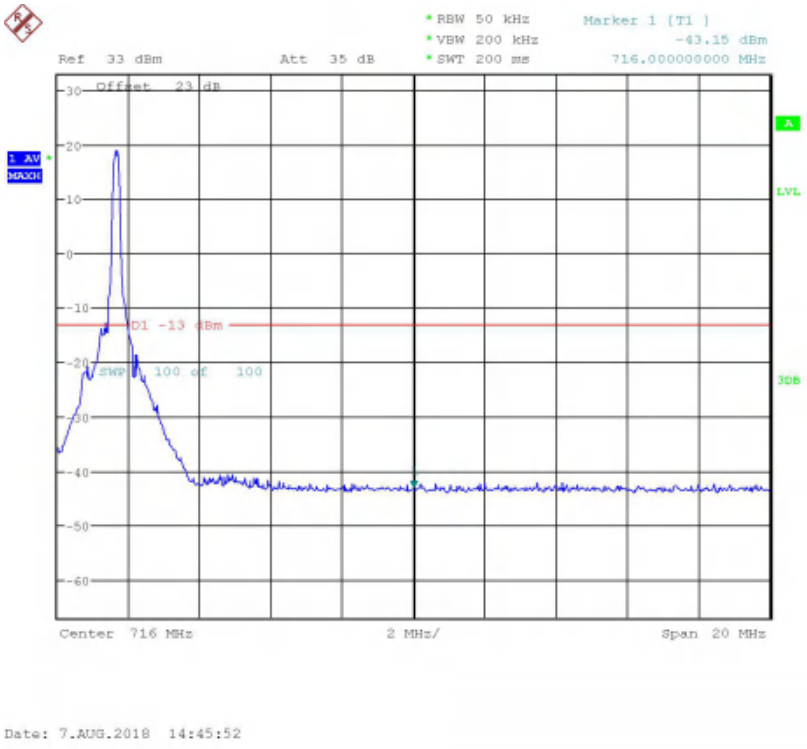
Band12-High Channel-5MHz Bandwidth-1RB-QPSK



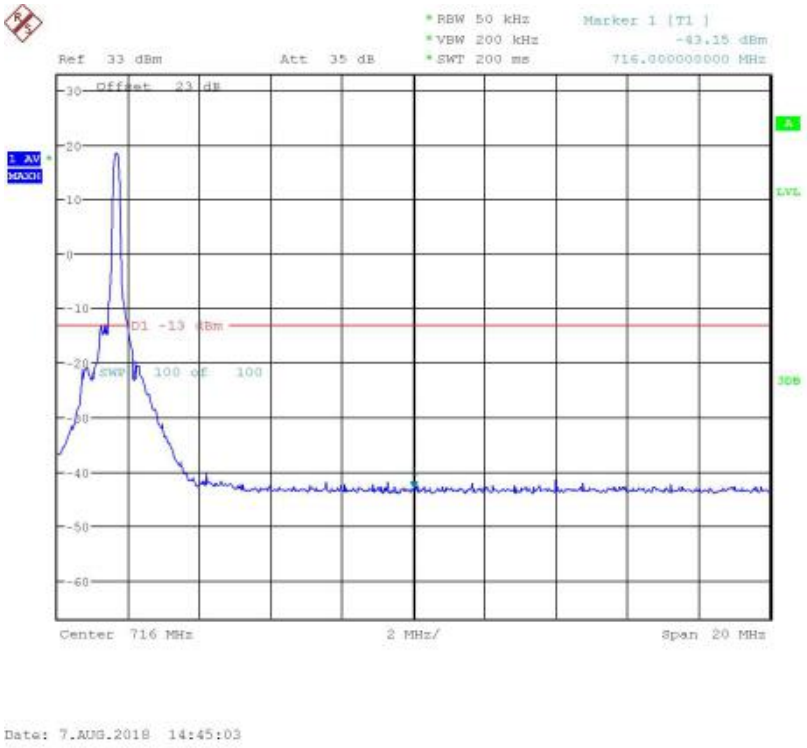
Band12-High Channel-5MHz Bandwidth-6RB-16QAM



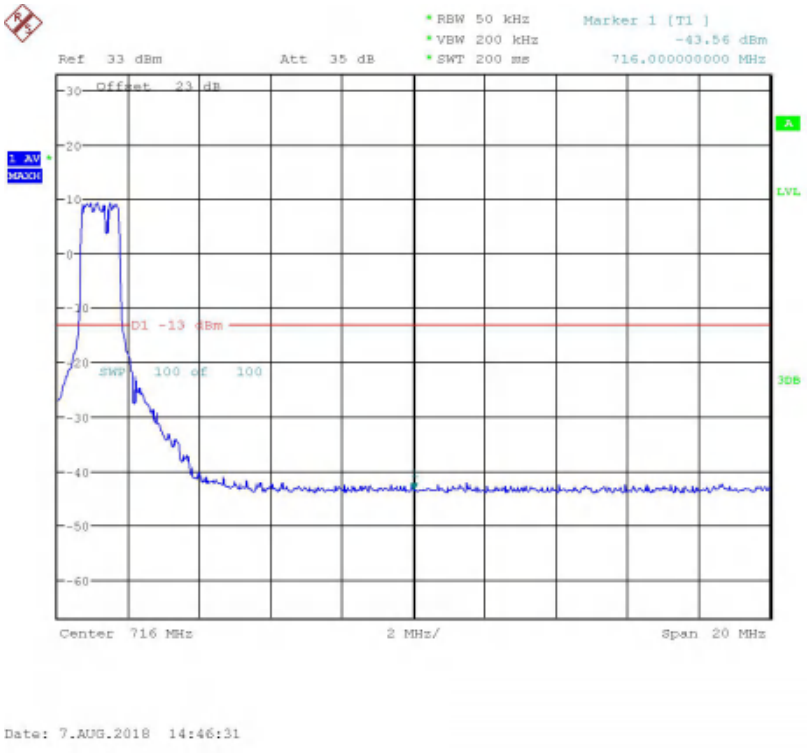
Band12-High Channel-5MHz Bandwidth-6RB-QPSK



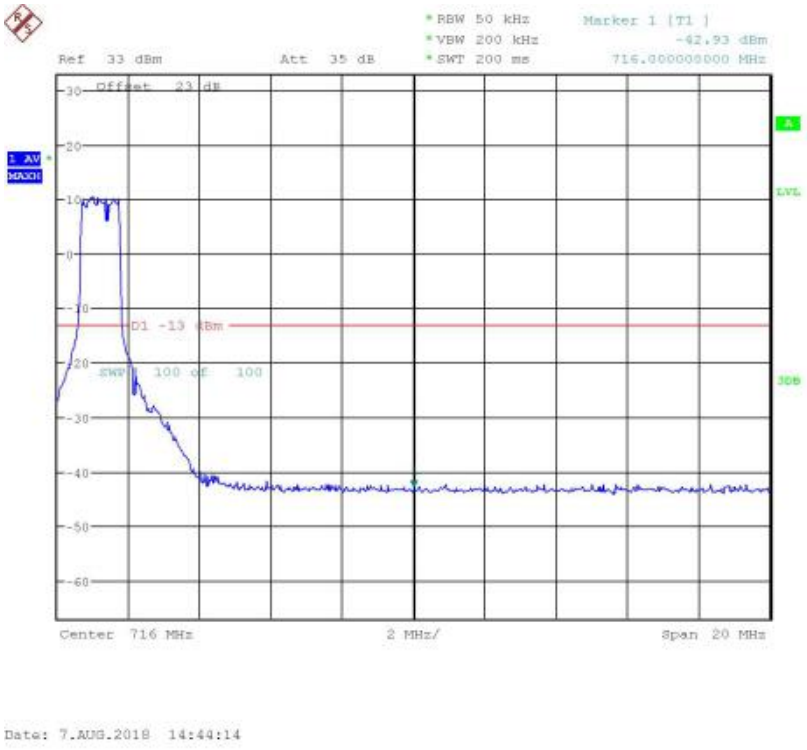
Band12-High Channel-10MHz Bandwidth-1RB-16QAM



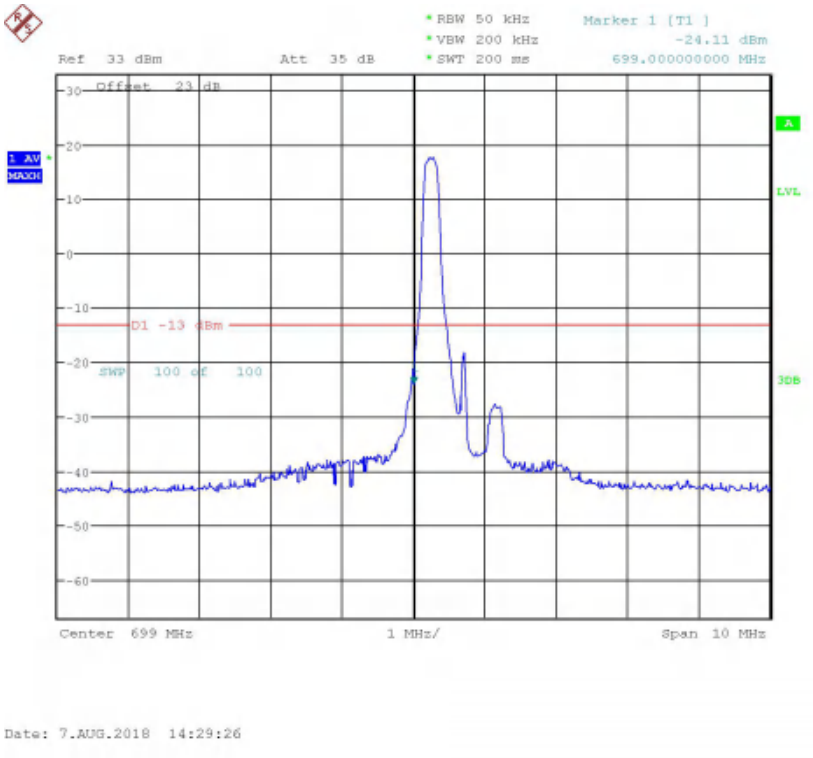
Band12-High Channel-10MHz Bandwidth-1RB-QPSK



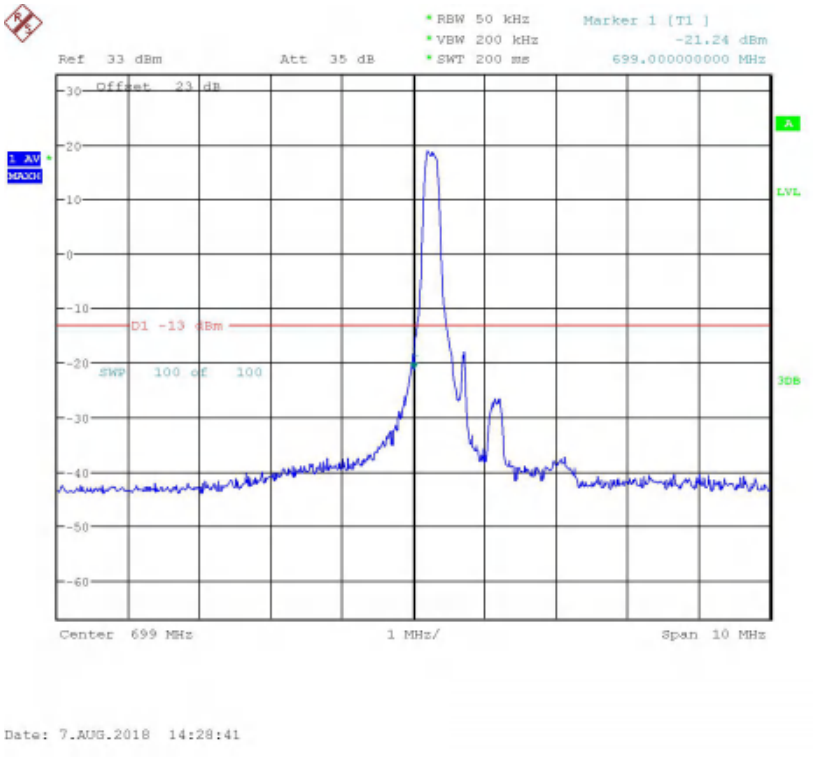
Band12-High Channel-10MHz Bandwidth-6RB-16QAM



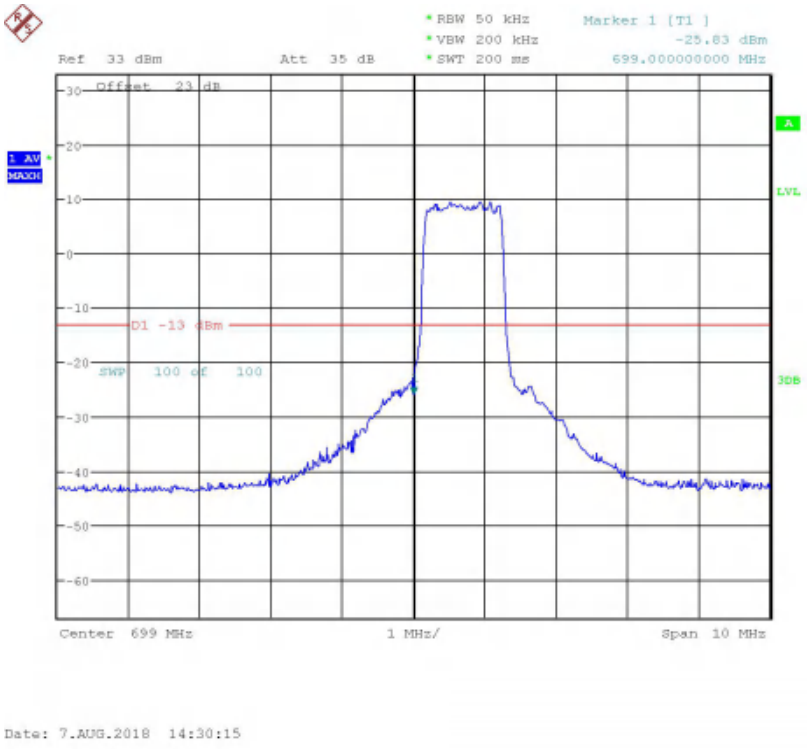
Band12-High Channel-10MHz Bandwidth-6RB-QPSK



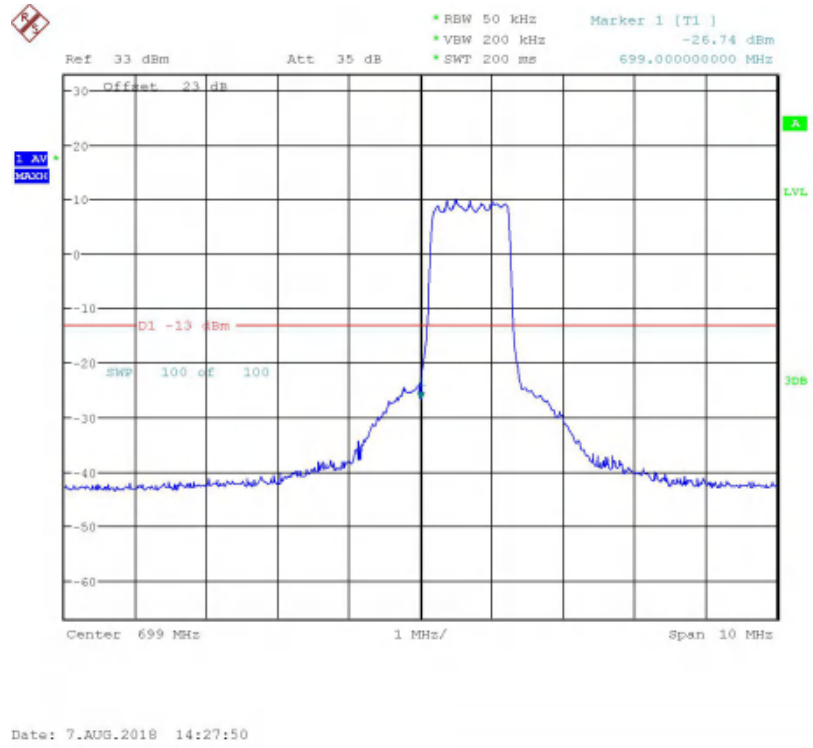
Band12-Low Channel-1.4MHz Bandwidth-1RB-16QAM



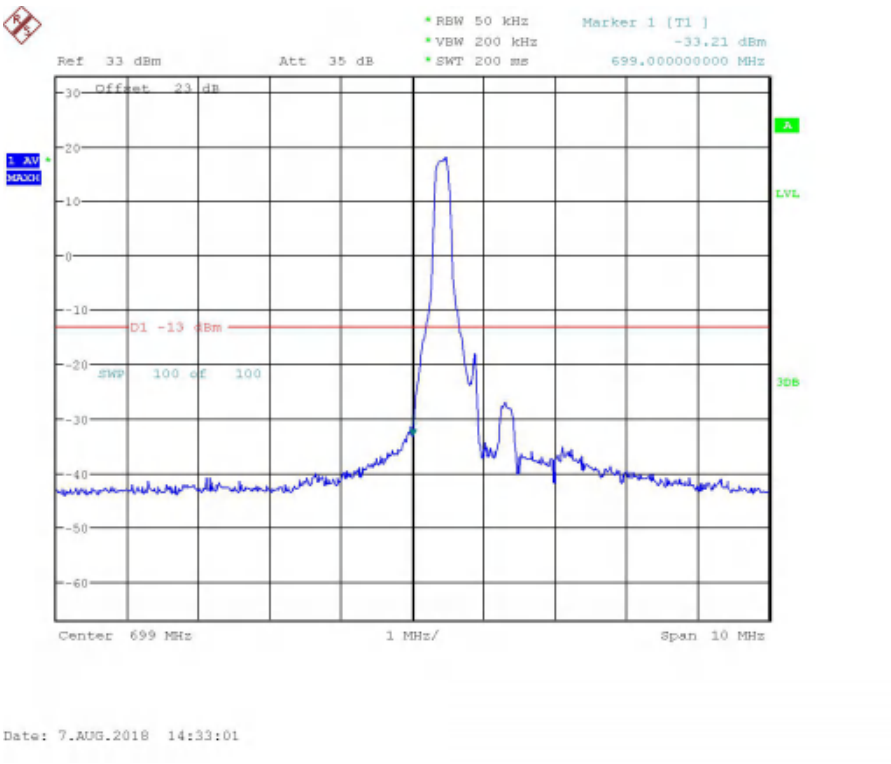
Band12-Low Channel-1.4MHz Bandwidth-1RB-QPSK



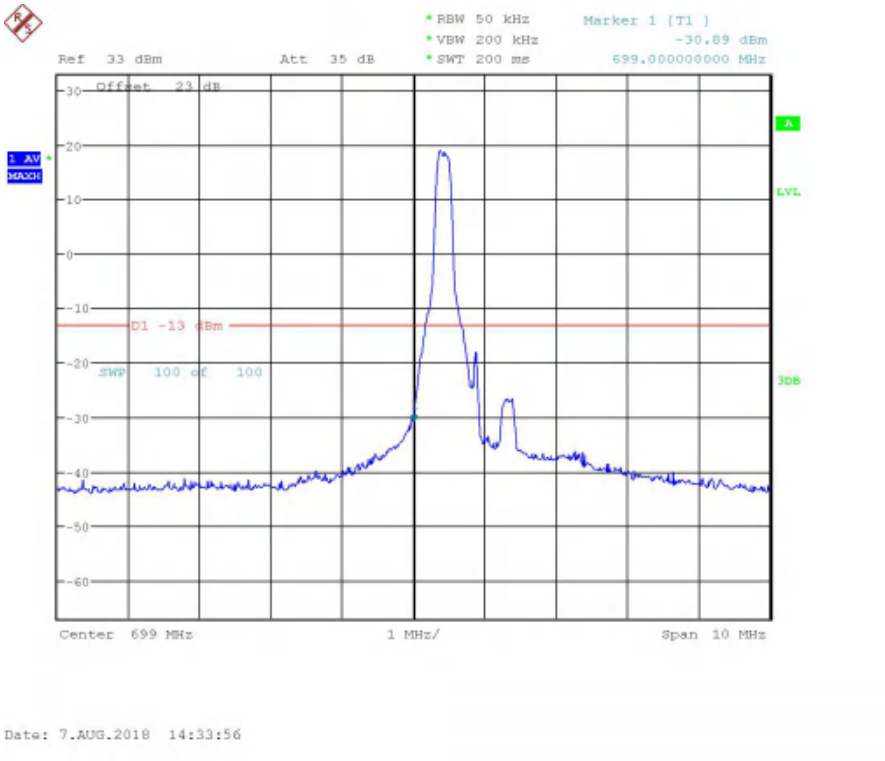
Band12-Low Channel-1.4MHz Bandwidth-6RB-16QAM



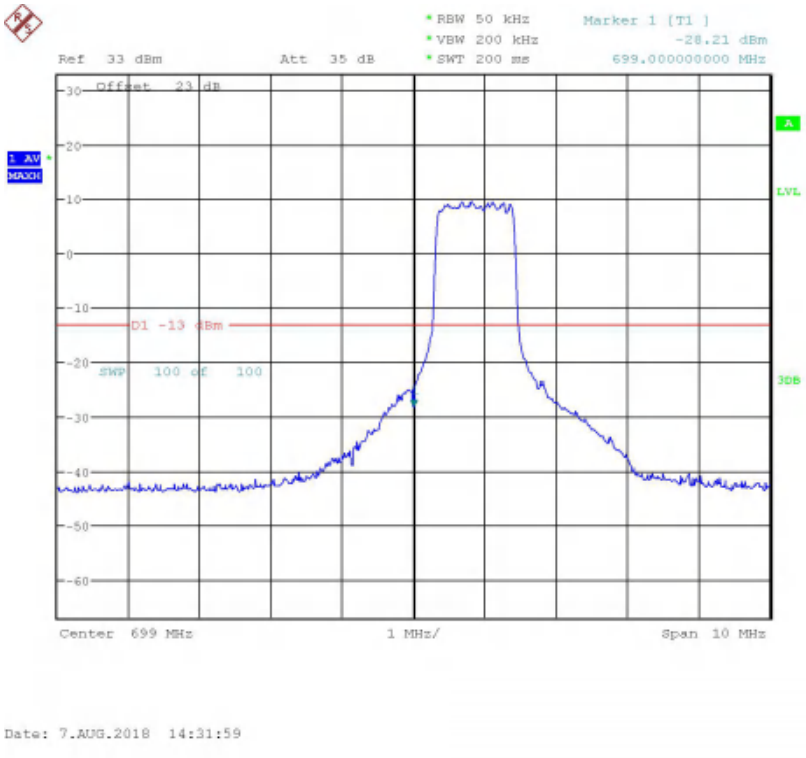
Band12-Low Channel-1.4MHz Bandwidth-6RB-QPSK



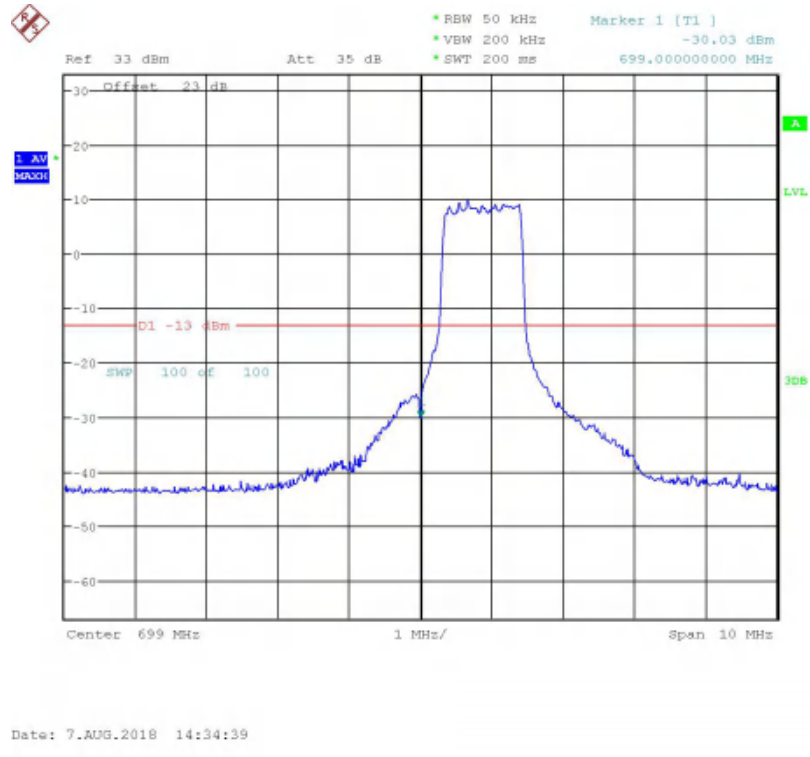
Band12-Low Channel-3MHz Bandwidth-1RB-16QAM



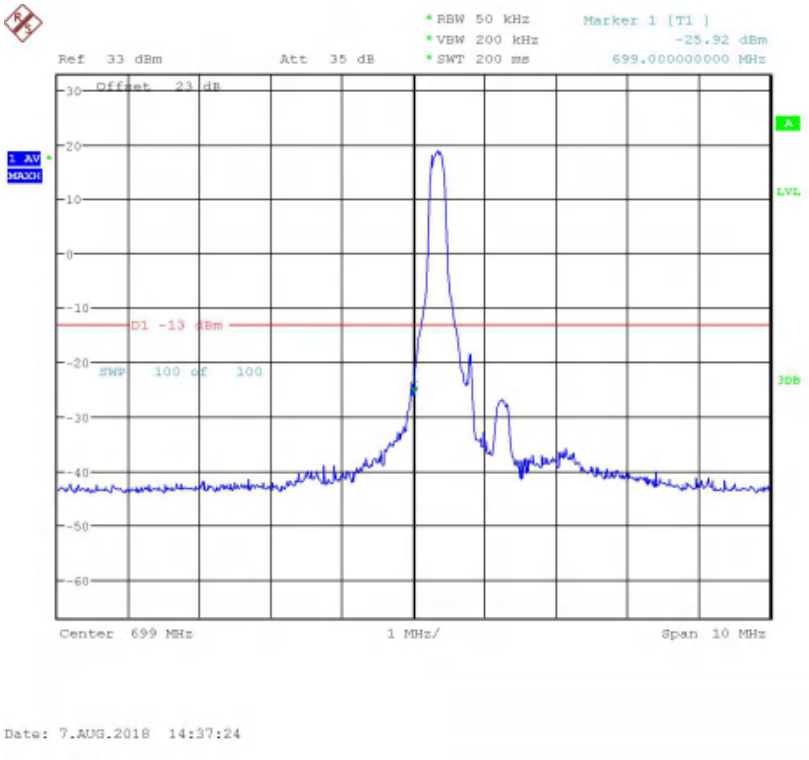
Band12-Low Channel-3MHz Bandwidth-1RB-QPSK



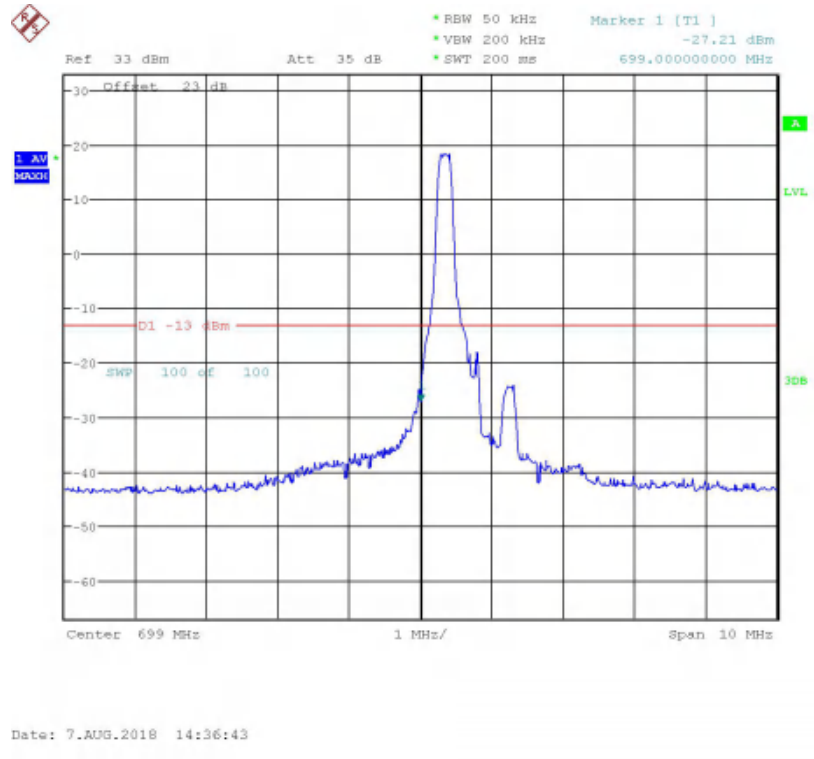
Band12-Low Channel-3MHz Bandwidth-6RB-16QAM



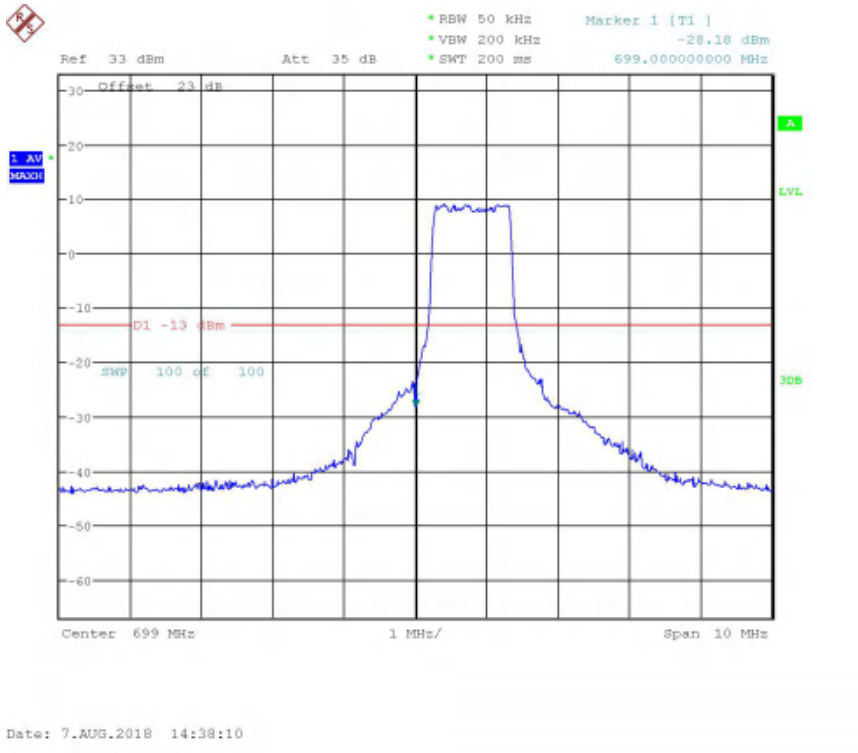
Band12-Low Channel-3MHz Bandwidth-6RB-QPSK



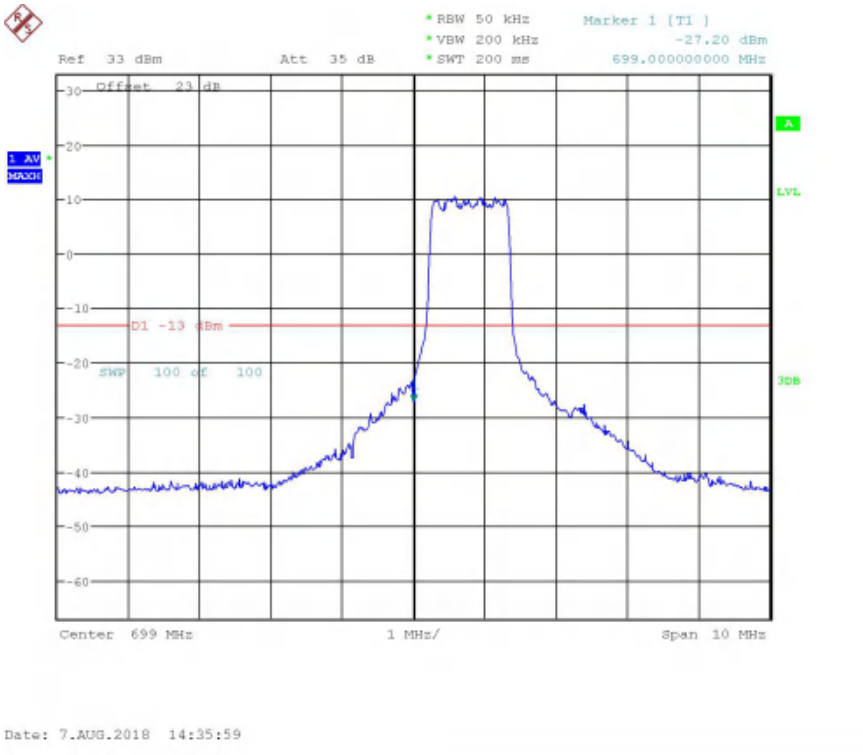
Band12-Low Channel-5MHz Bandwidth-1RB-16QAM



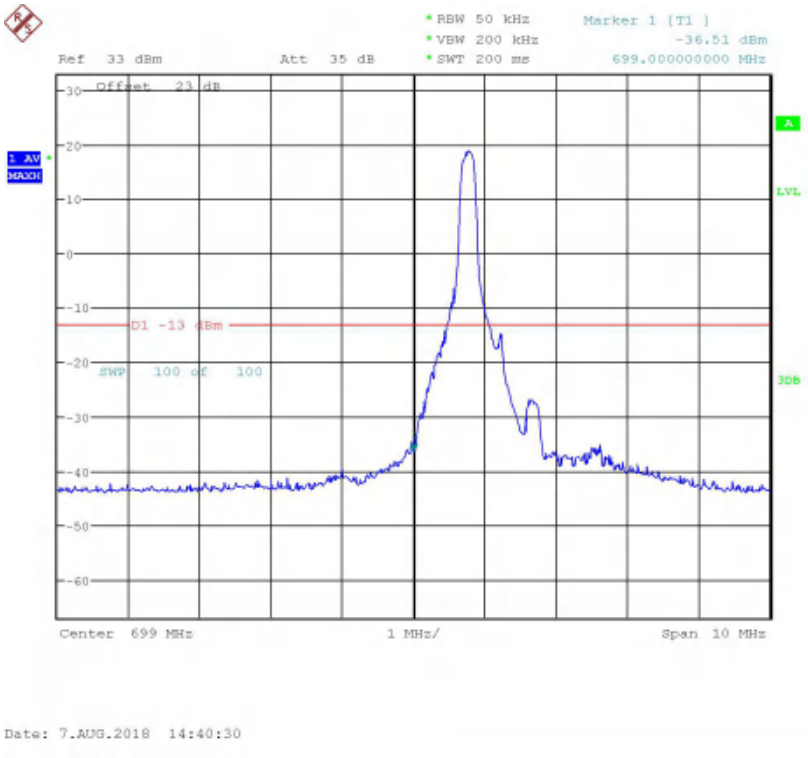
Band12-Low Channel-5MHz Bandwidth-1RB-QPSK



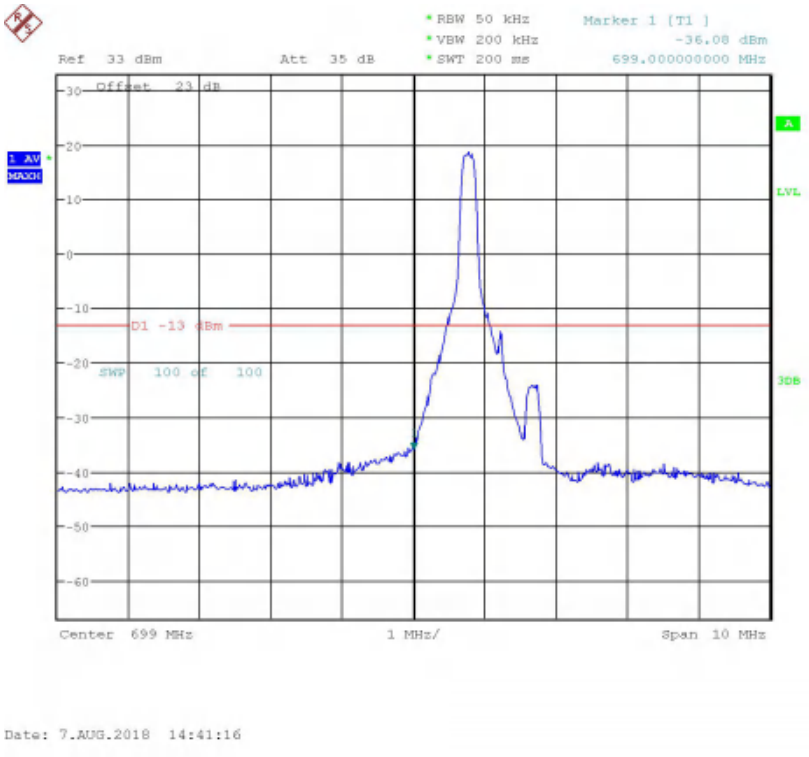
Band12-Low Channel-5MHz Bandwidth-6RB-16QAM



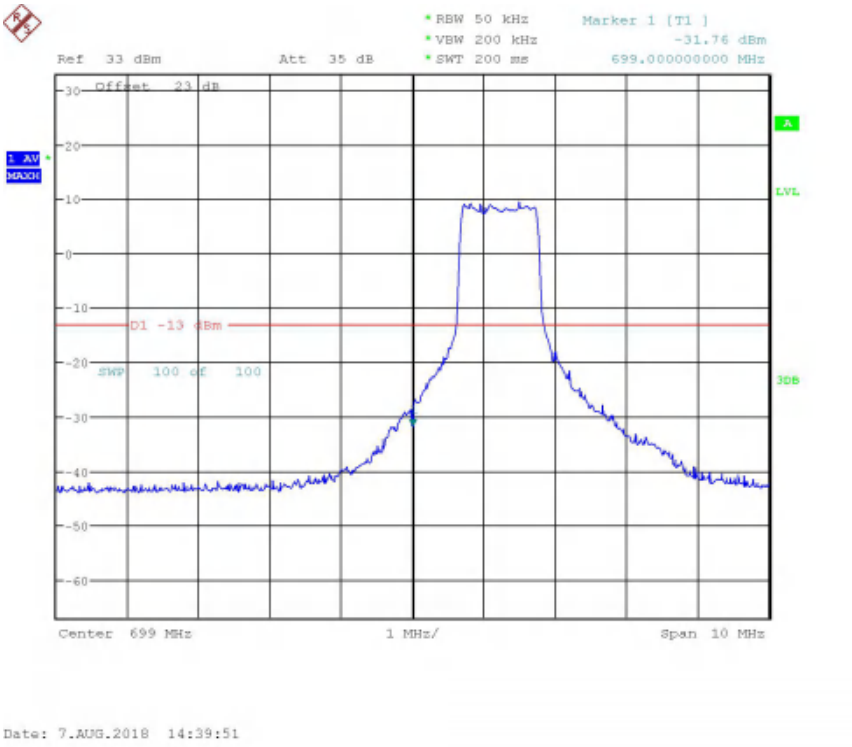
Band12-Low Channel-5MHz Bandwidth-6RB-QPSK



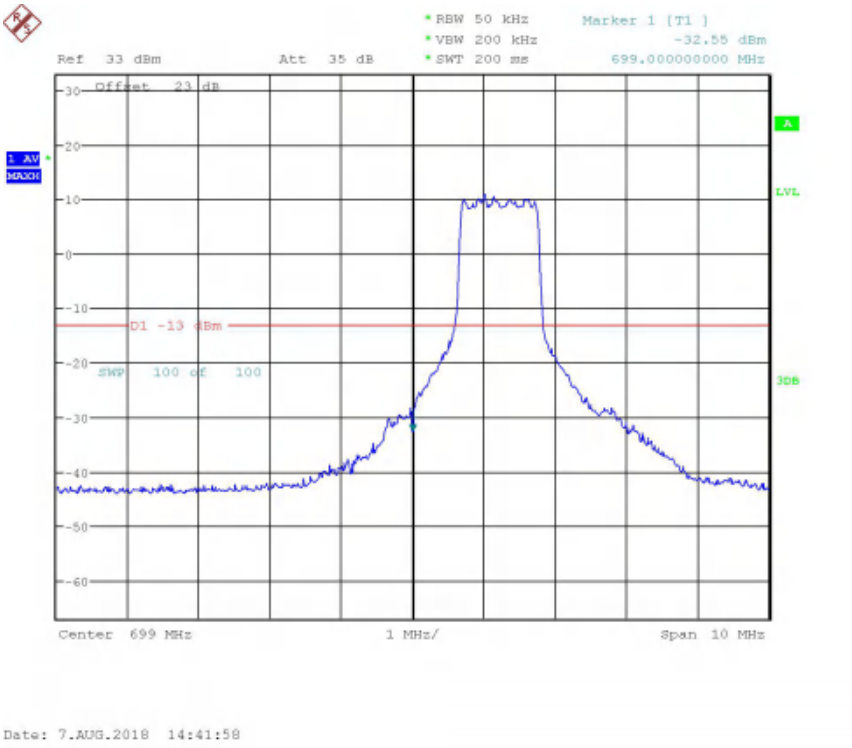
Band12-Low Channel-10MHz Bandwidth-1RB-16QAM



Band12-Low Channel-10MHz Bandwidth-1RB-QPSK

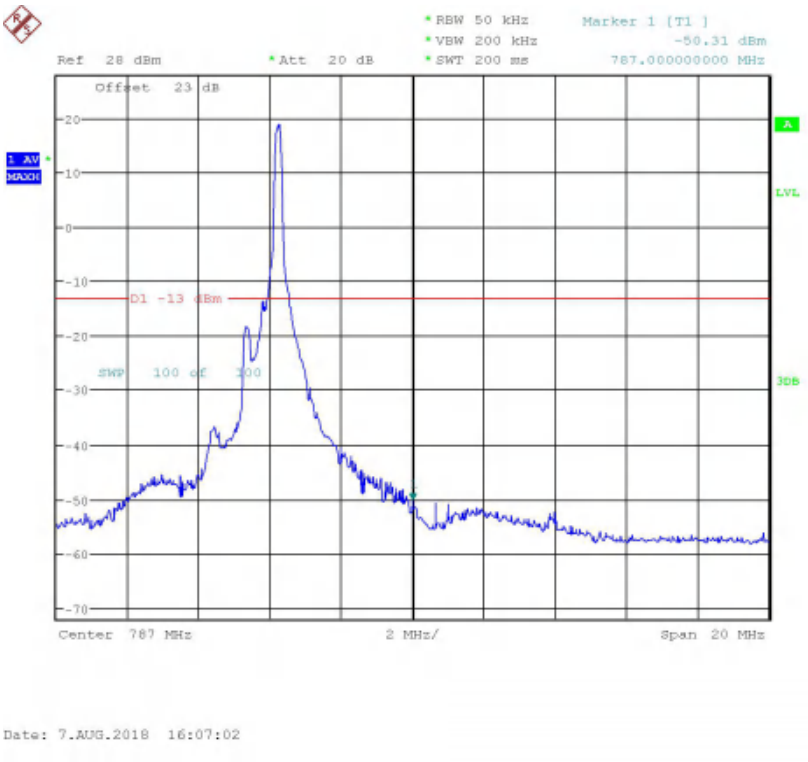


Band12-Low Channel-10MHz Bandwidth-6RB-16QAM

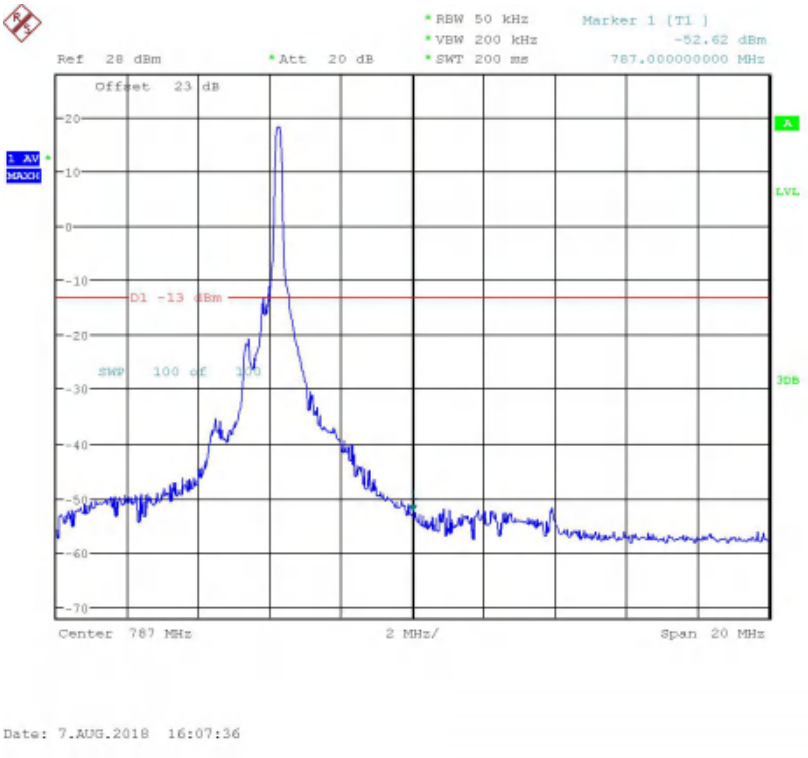


Band12-Low Channel-10MHz Bandwidth-6RB-QPSK

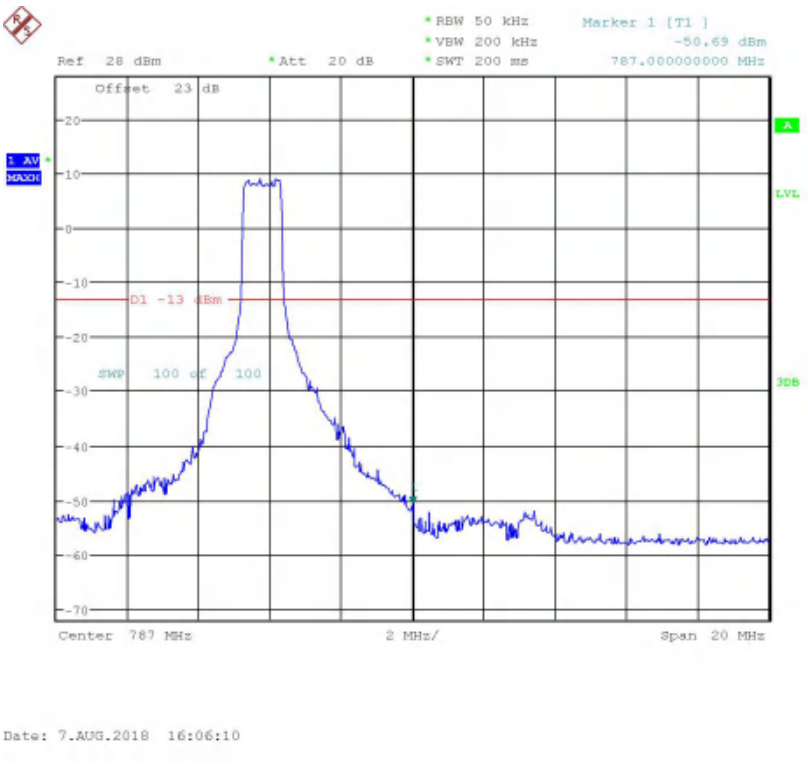
5.5.11 CAT-M Band13 Edge Results



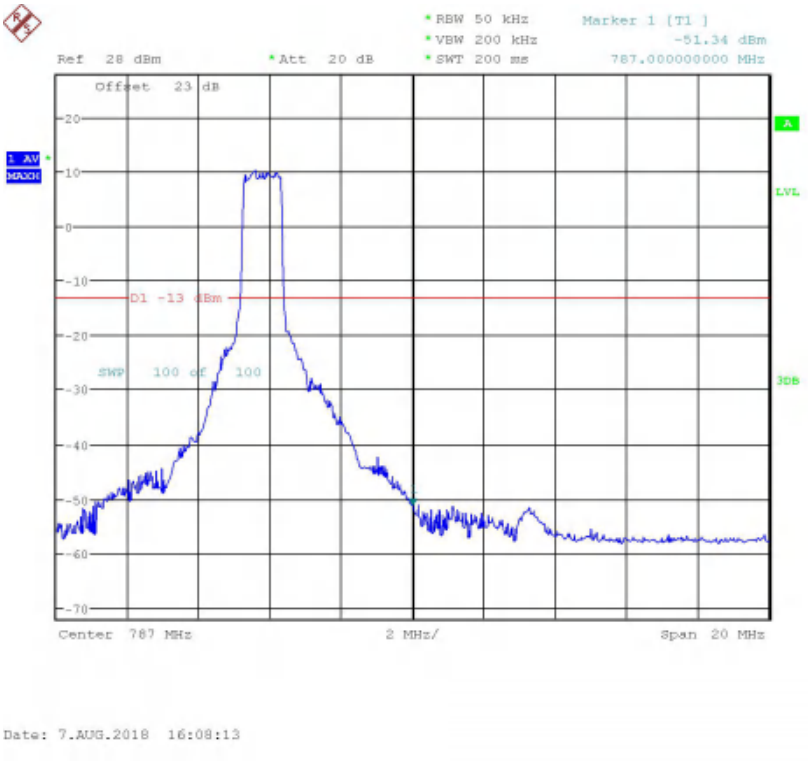
Band13-High Channel-5MHz Bandwidth-1RB-16QAM



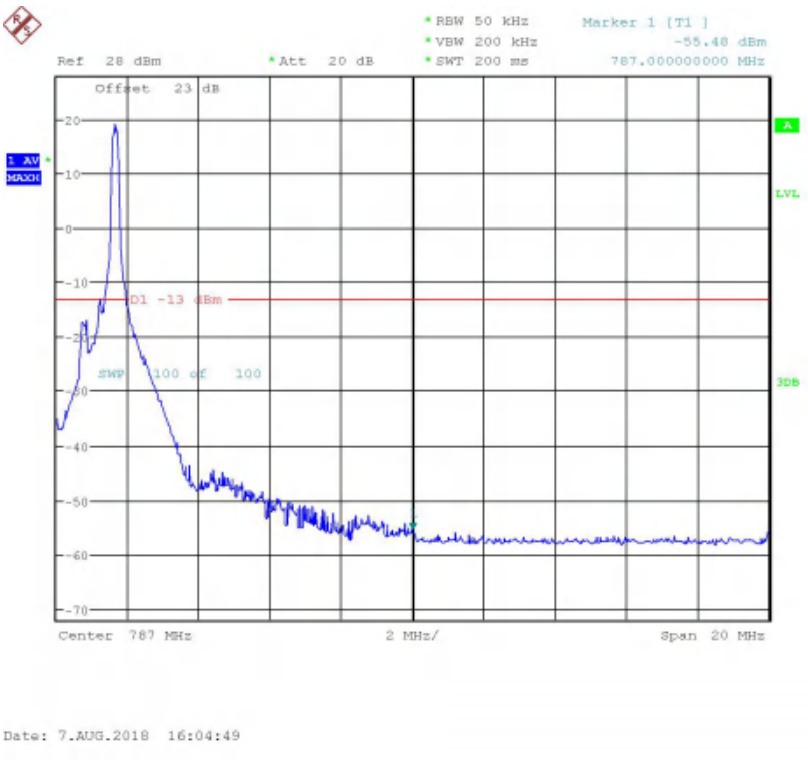
Band13-High Channel-5MHz Bandwidth-1RB-QPSK



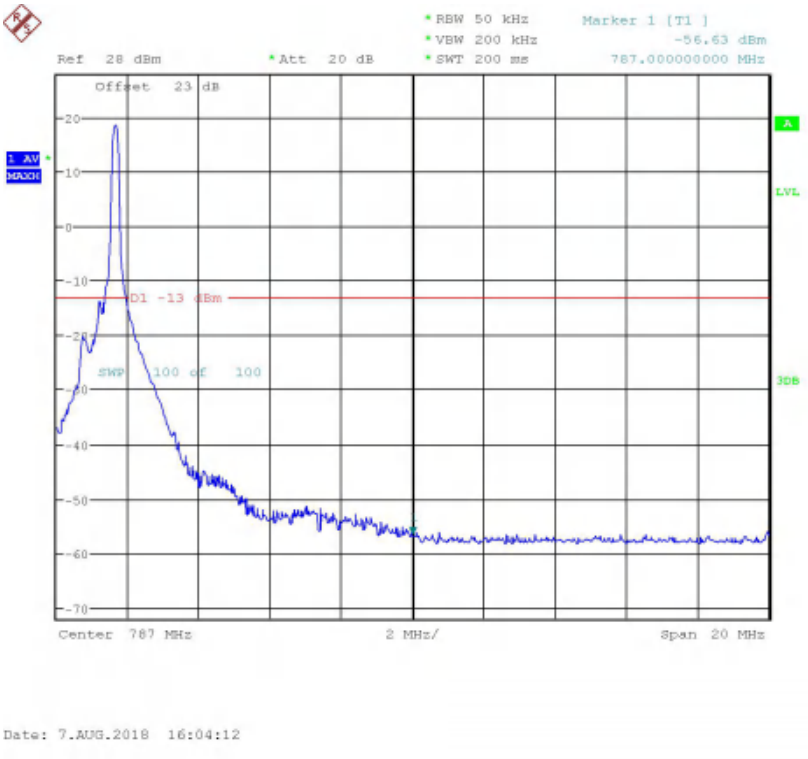
Band13-High Channel-5MHz Bandwidth-6RB-16QAM



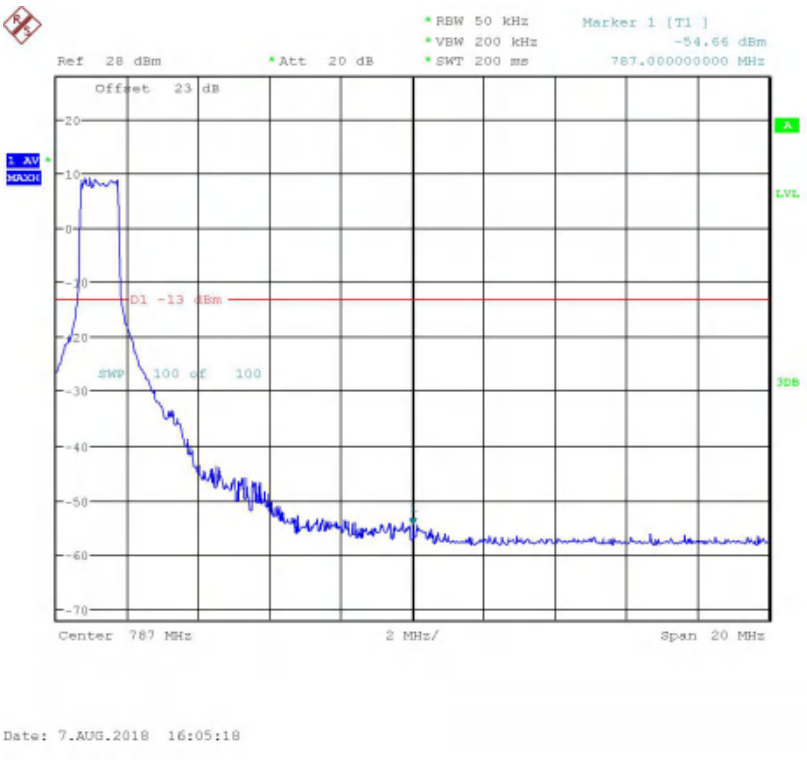
Band13-High Channel-5MHz Bandwidth-6RB-QPSK



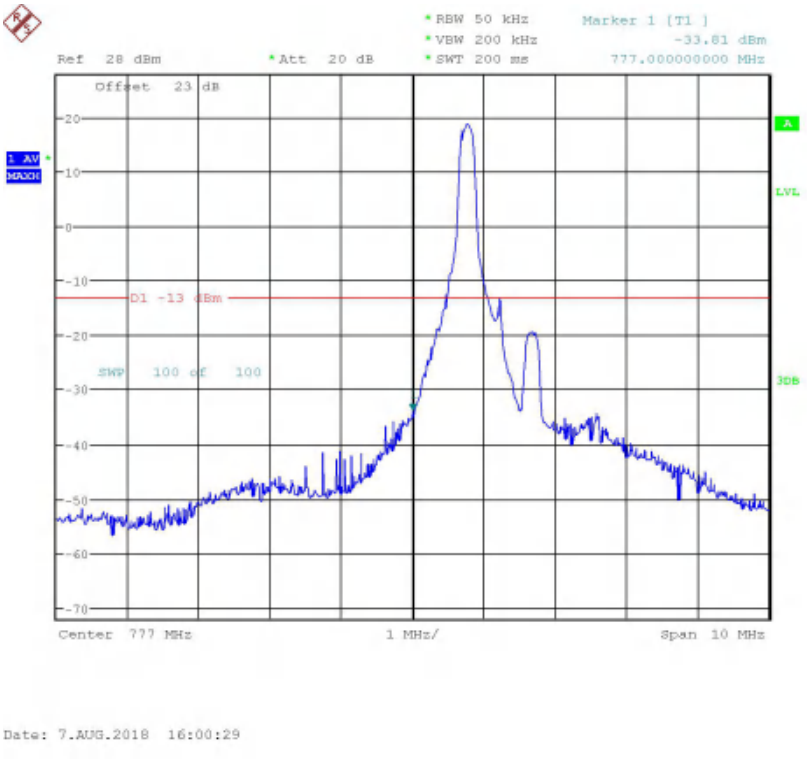
Band13-High Channel-10MHz Bandwidth-1RB-16QAM



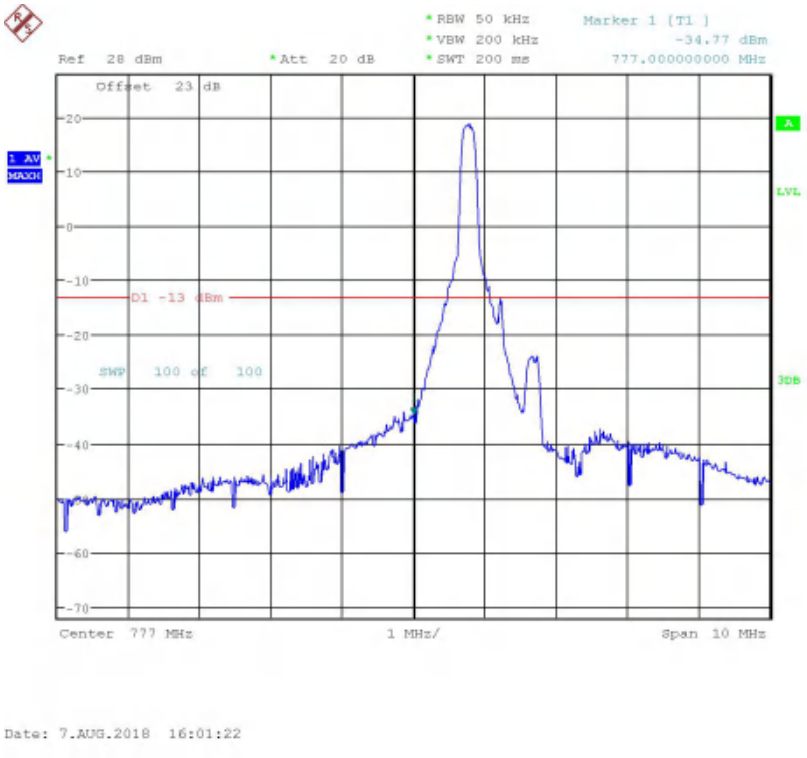
Band13-High Channel-10MHz Bandwidth-1RB-QPSK



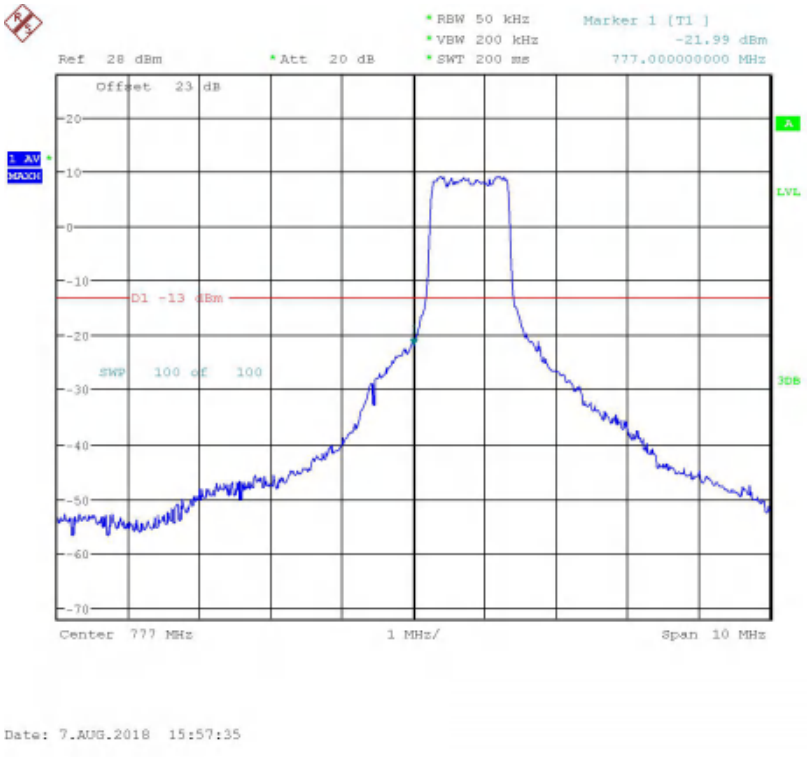
Band13-High Channel-10MHz Bandwidth-6RB-16QAM



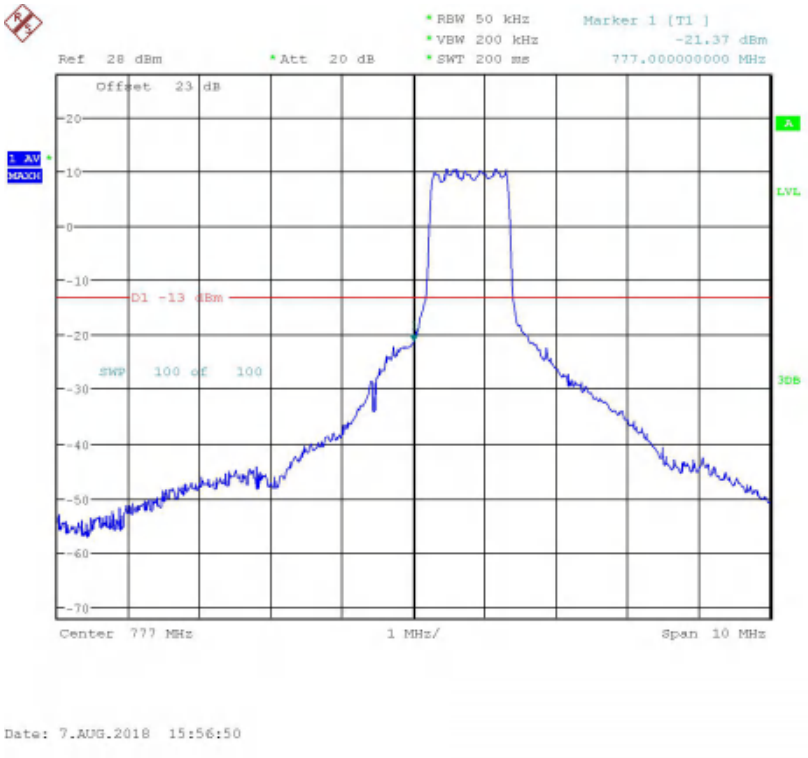
Band13-Low Channel-5MHz Bandwidth-1RB-16QAM



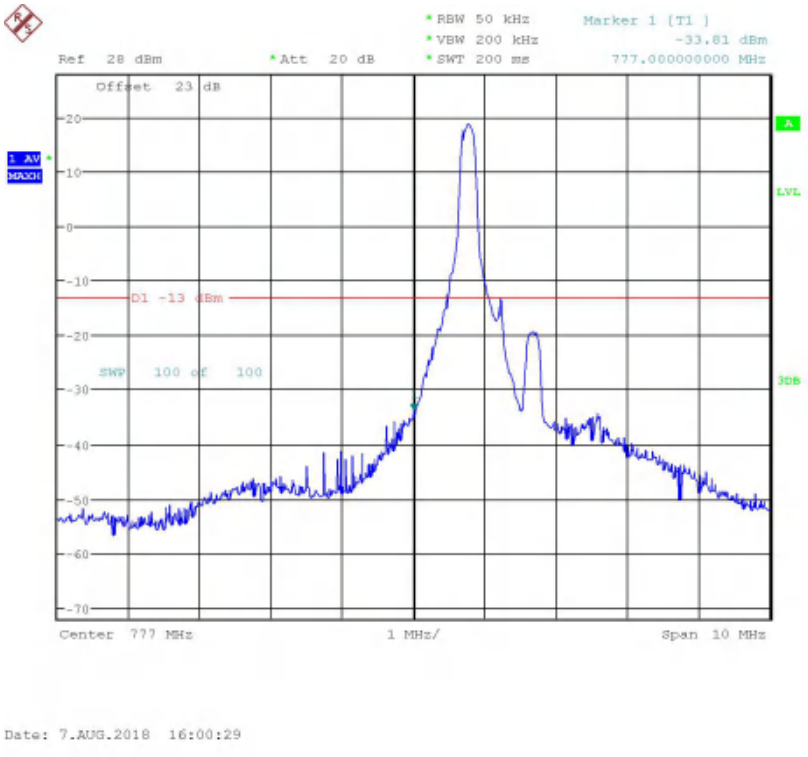
Band13-Low Channel-5MHz Bandwidth-1RB-QPSK



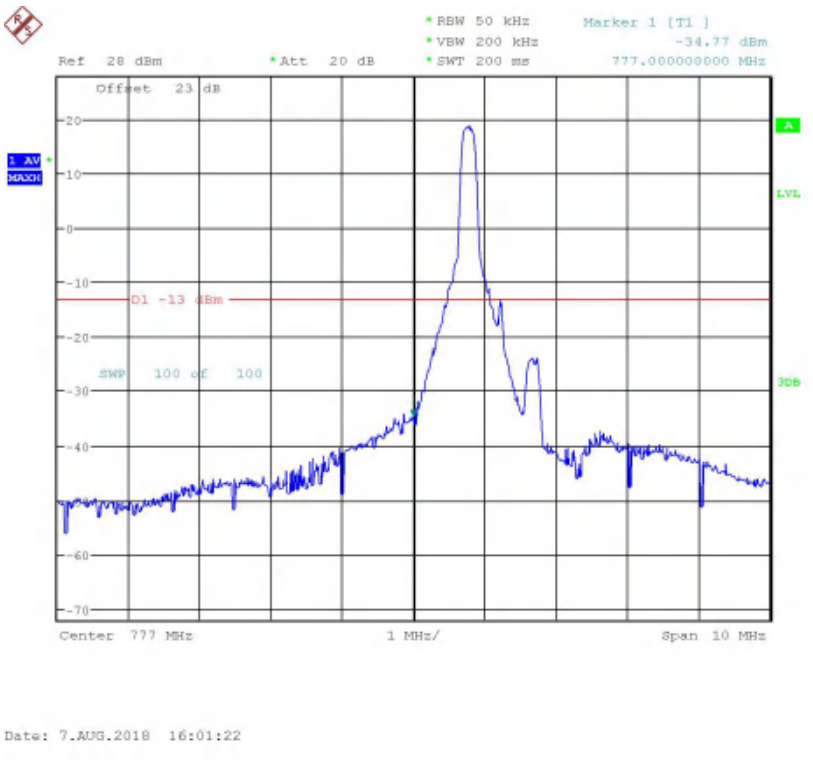
Band13-Low Channel-5MHz Bandwidth-6RB-16QAM



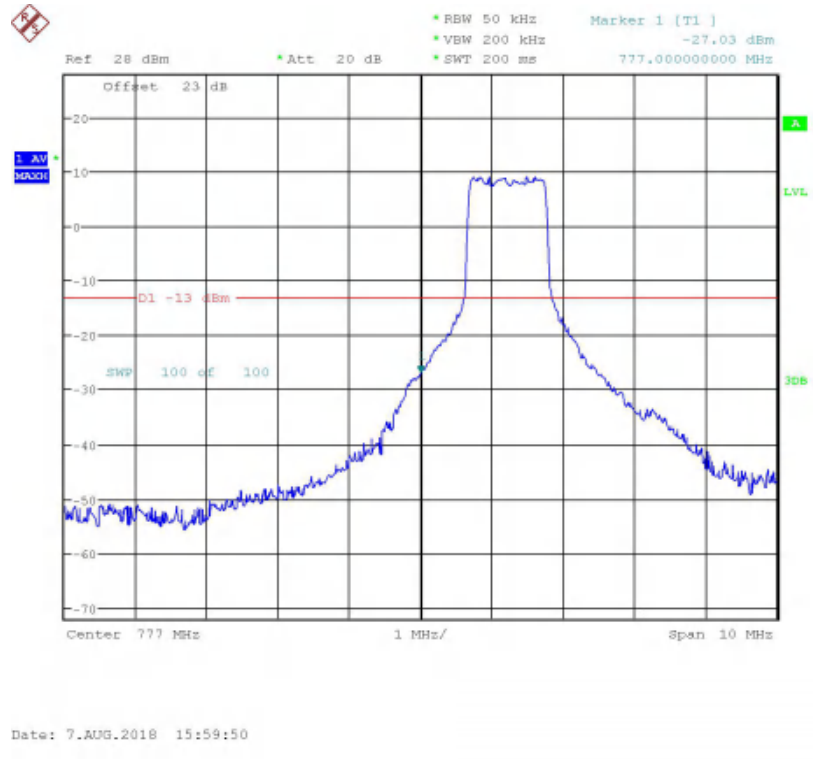
Band13-Low Channel-5MHz Bandwidth-6RB-QPSK



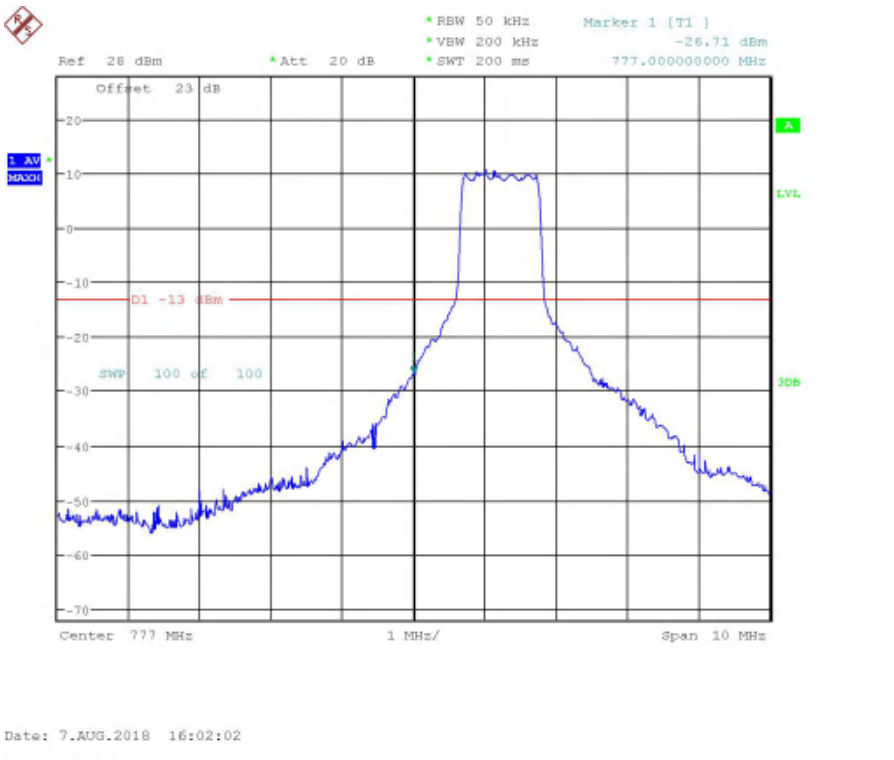
Band13-Low Channel-10MHz Bandwidth-1RB-16QAM



Band13-Low Channel-10MHz Bandwidth-1RB-QPSK

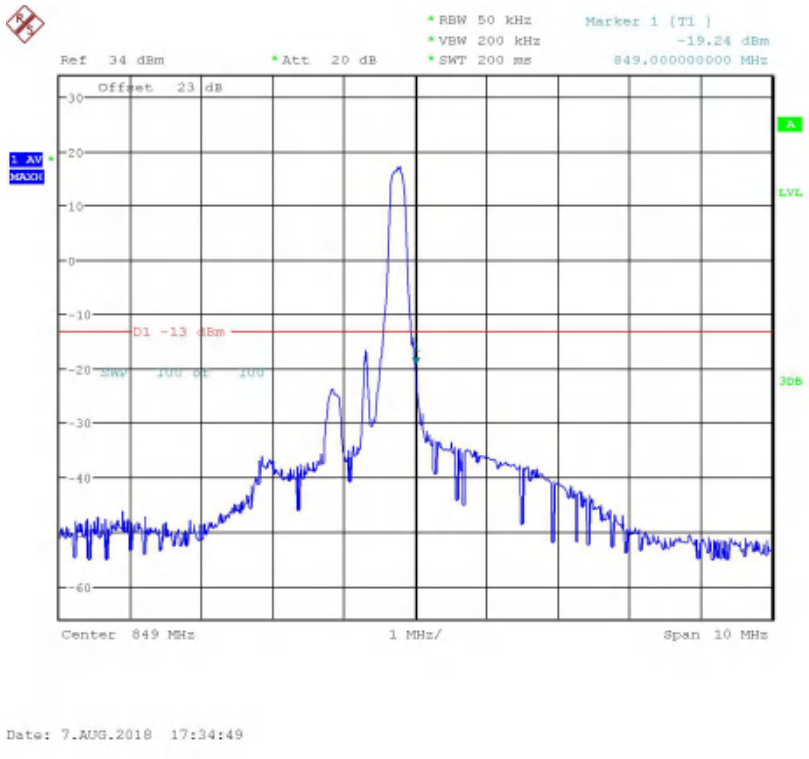


Band13-Low Channel-10MHz Bandwidth-6RB-16QAM

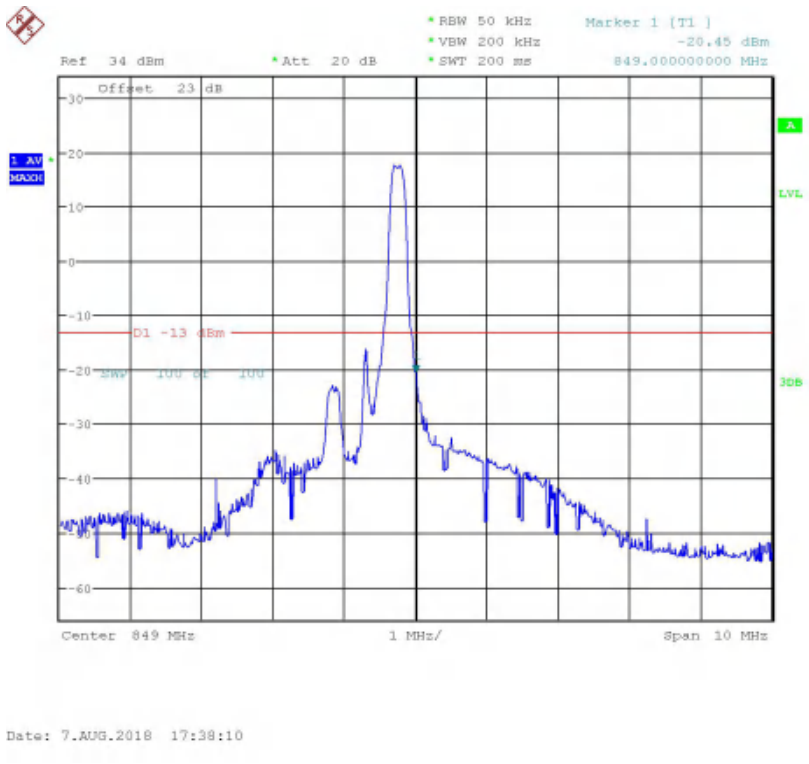


Band13-Low Channel-10MHz Bandwidth-6RB-QPSK

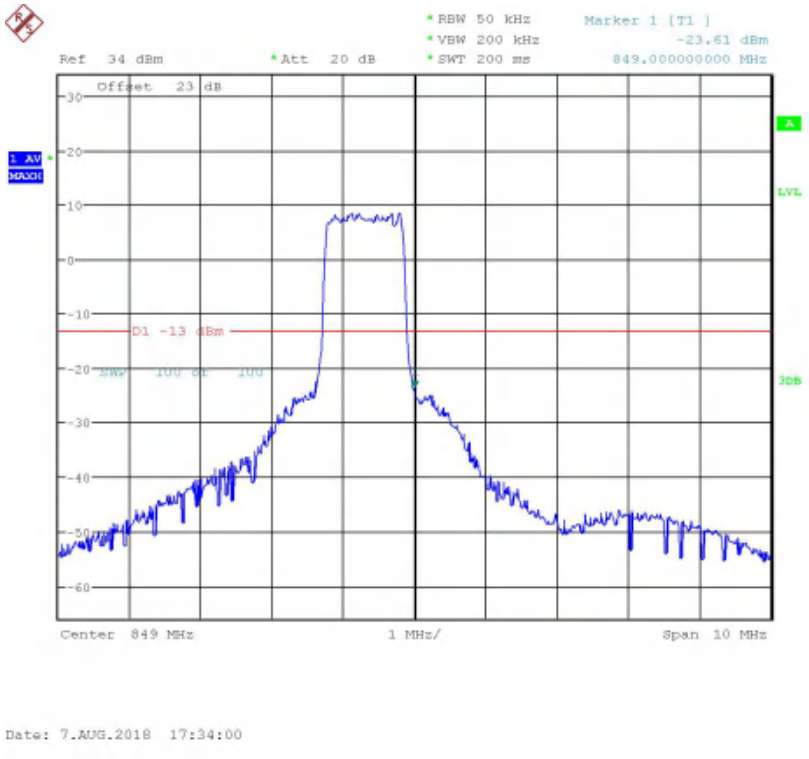
5.5.12 CAT-M Band26 Edge Results



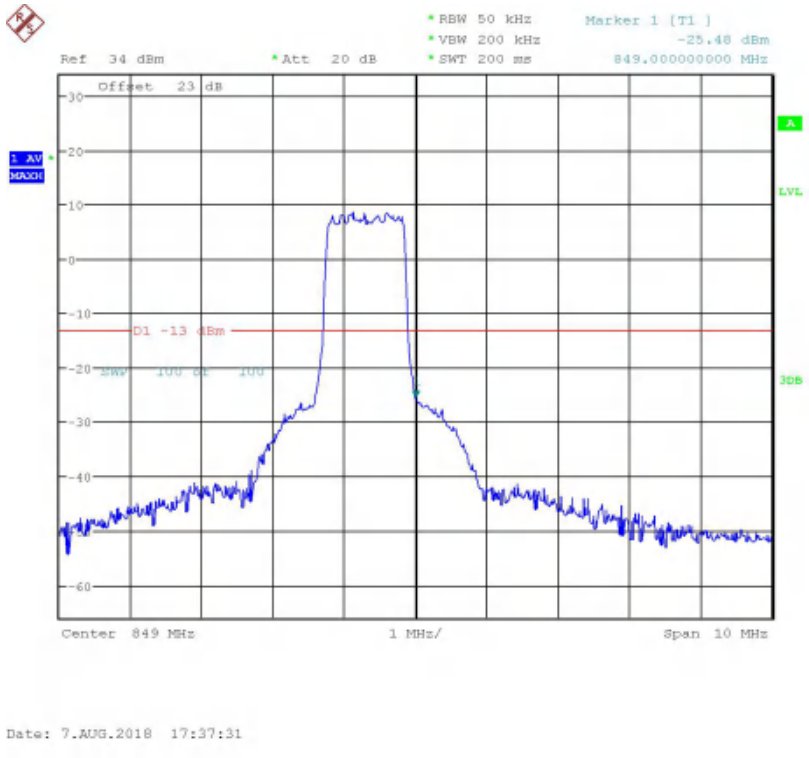
Band26-High Channel-1.4MHz Bandwidth-1RB-16QAM



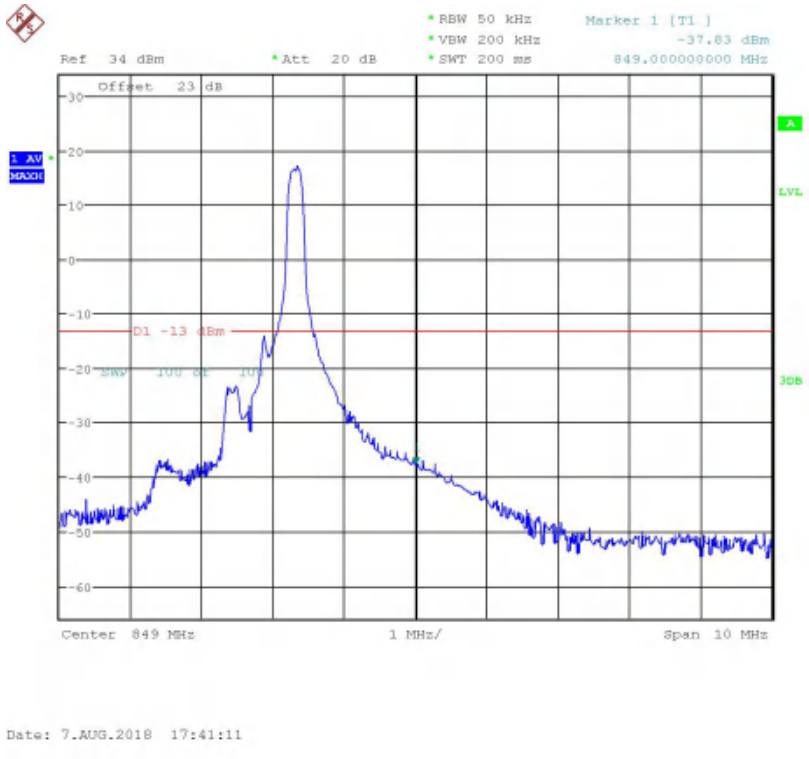
Band26-High Channel-1.4MHz Bandwidth-1RB-QPSK



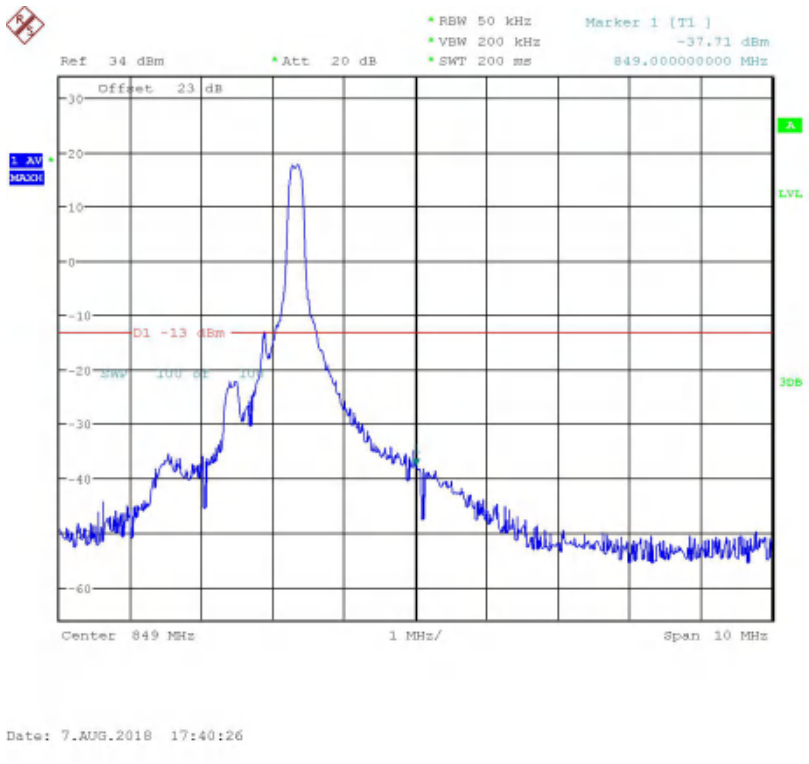
Band26-High Channel-1.4MHz Bandwidth-6RB-16QAM



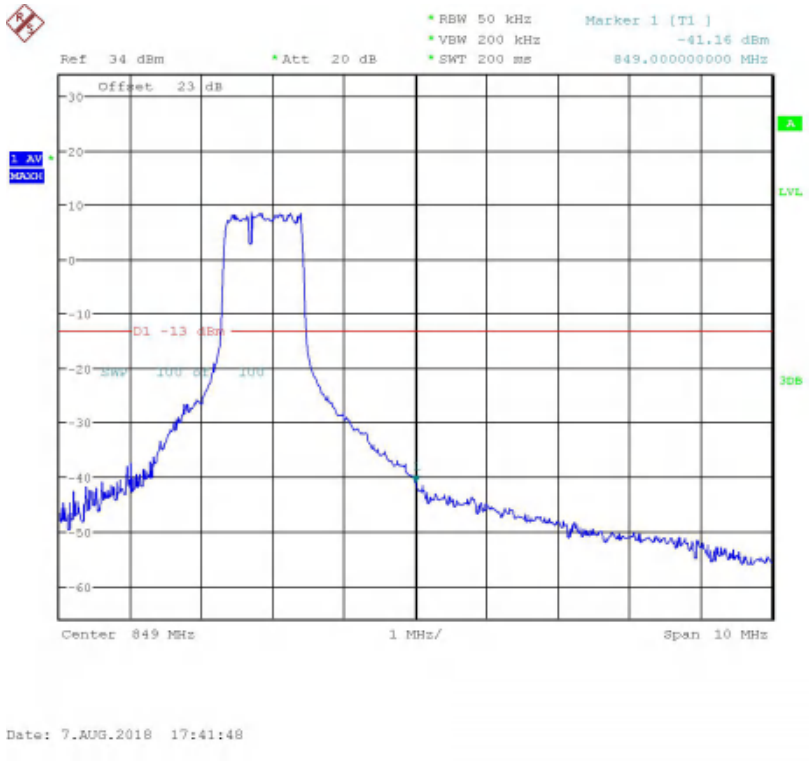
Band26-High Channel-1.4MHz Bandwidth-6RB-QPSK



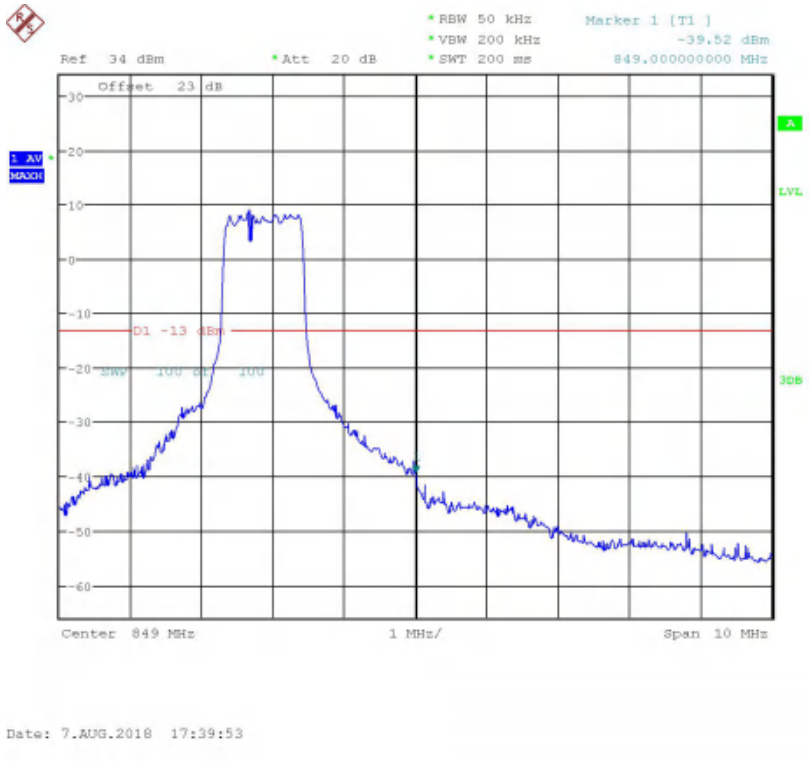
Band26-High Channel-3MHz Bandwidth-1RB-16QAM



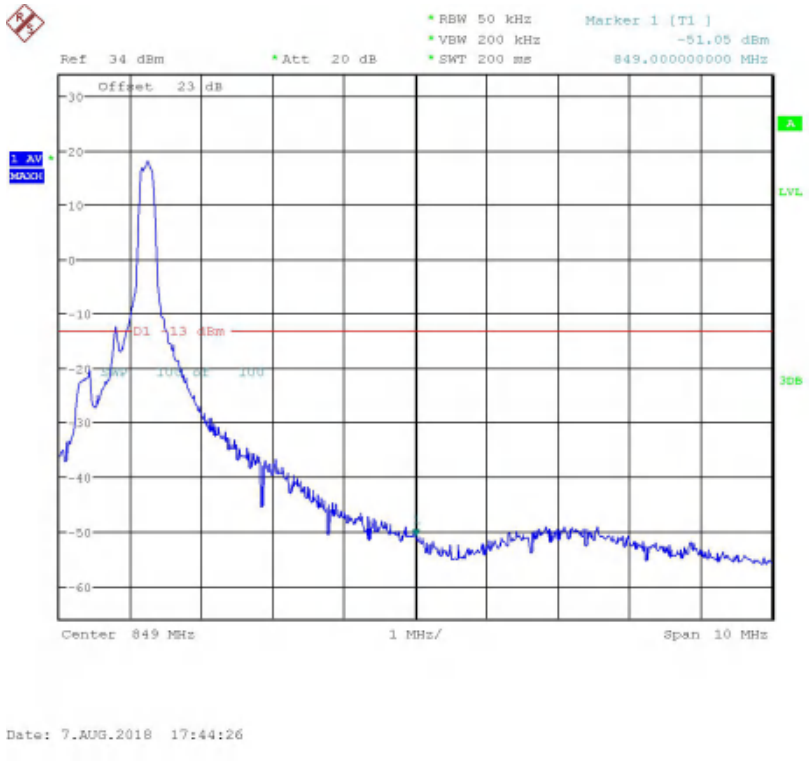
Band26-High Channel-3MHz Bandwidth-1RB-QPSK



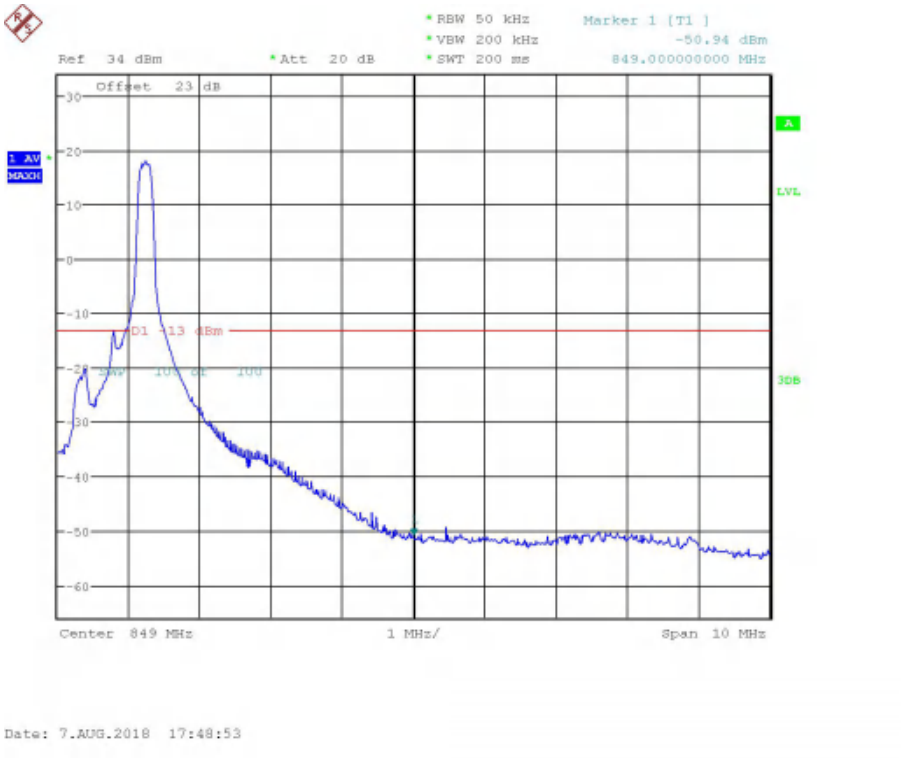
Band26-High Channel-3MHz Bandwidth-6RB-16QAM



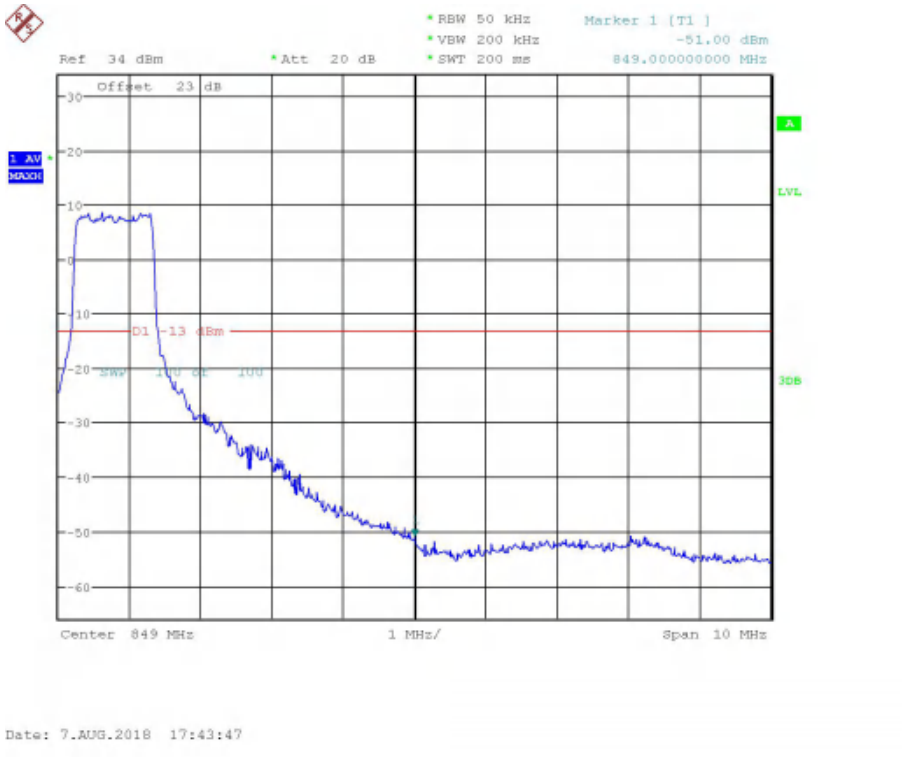
Band26-High Channel-3MHz Bandwidth-6RB-QPSK



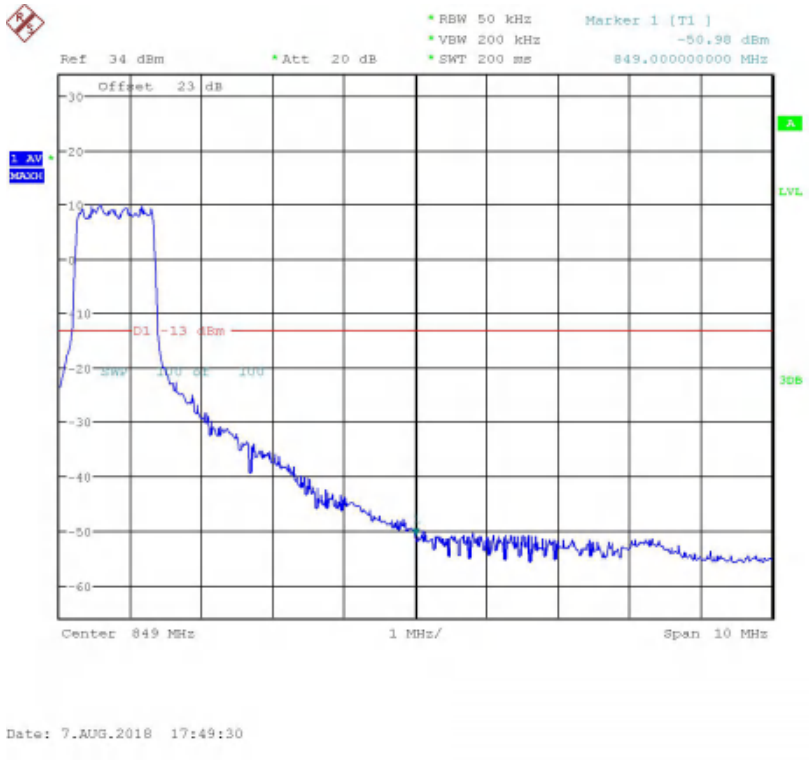
Band26-High Channel-5MHz Bandwidth-1RB-16QAM



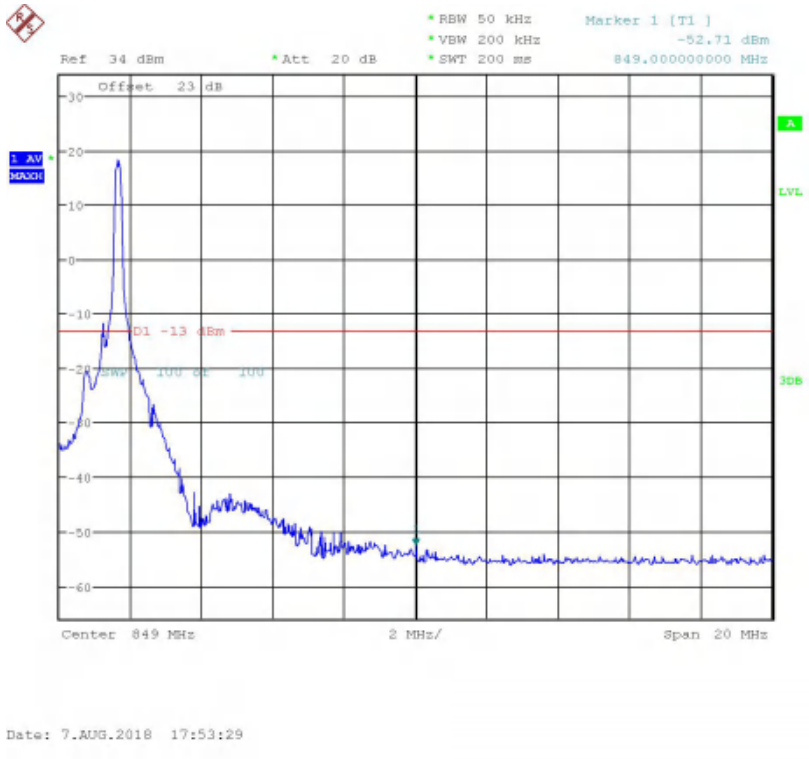
Band26-High Channel-5MHz Bandwidth-1RB-QPSK



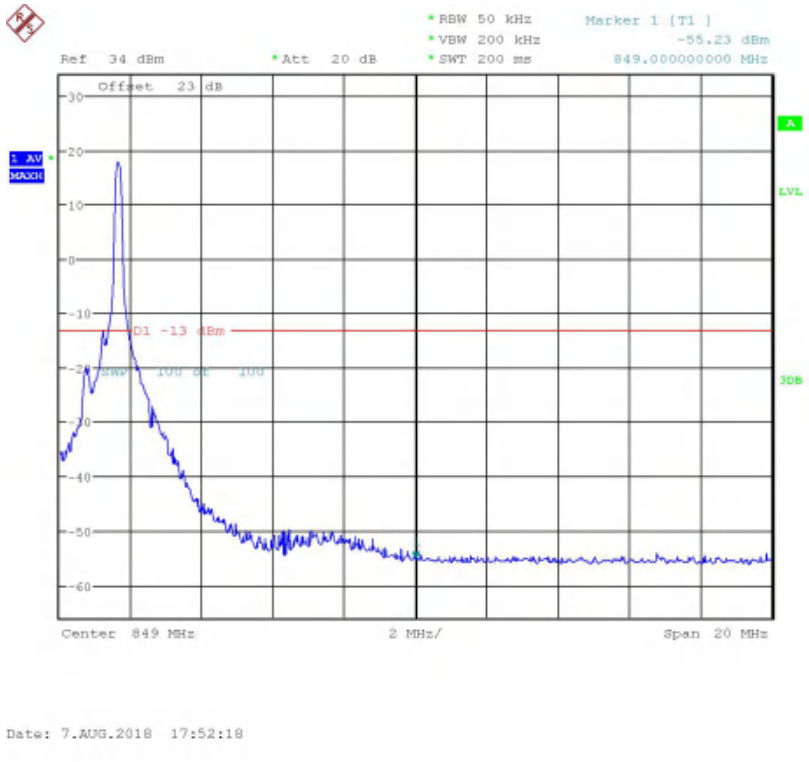
Band26-High Channel-5MHz Bandwidth-6RB-16QAM



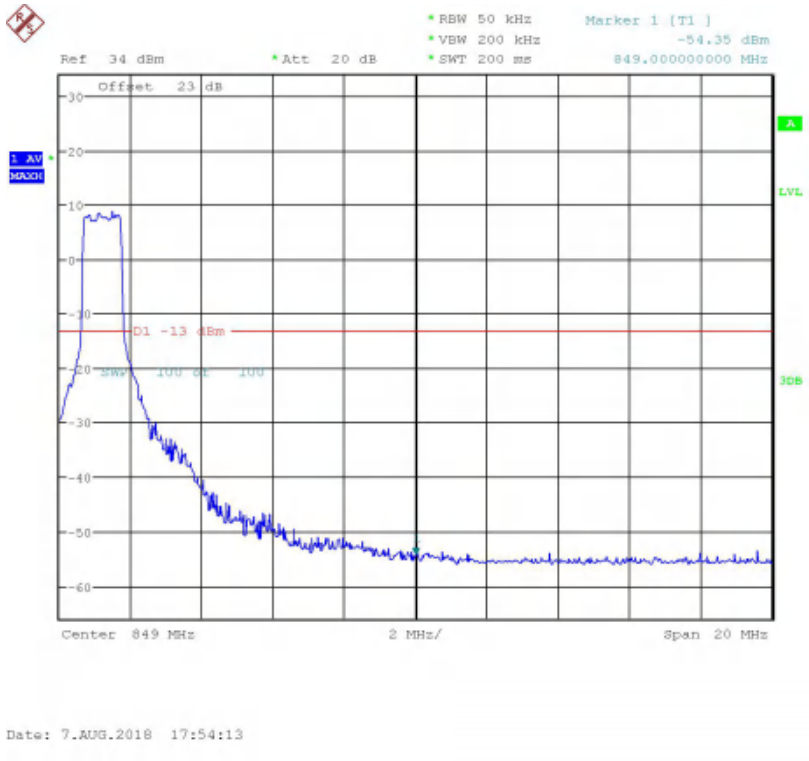
Band26-High Channel-5MHz Bandwidth-6RB-QPSK



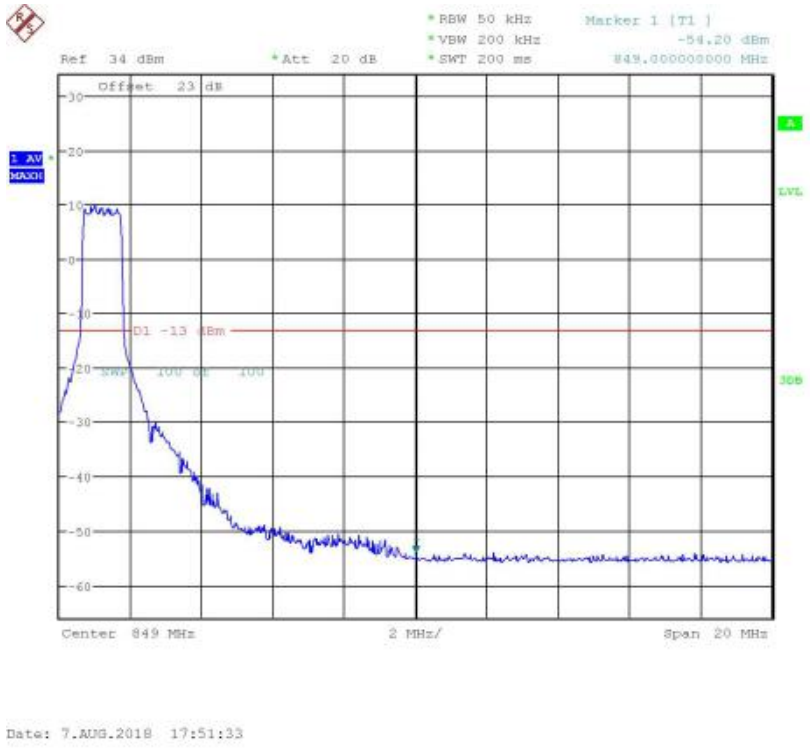
Band26-High Channel-10MHz Bandwidth-1RB-16QAM



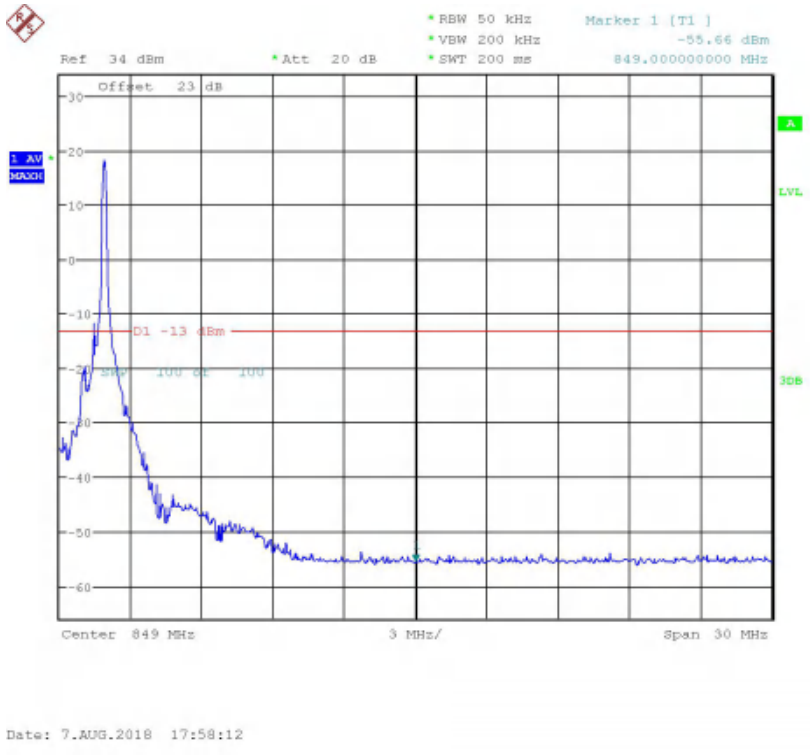
Band26-High Channel-10MHz Bandwidth-1RB-QPSK



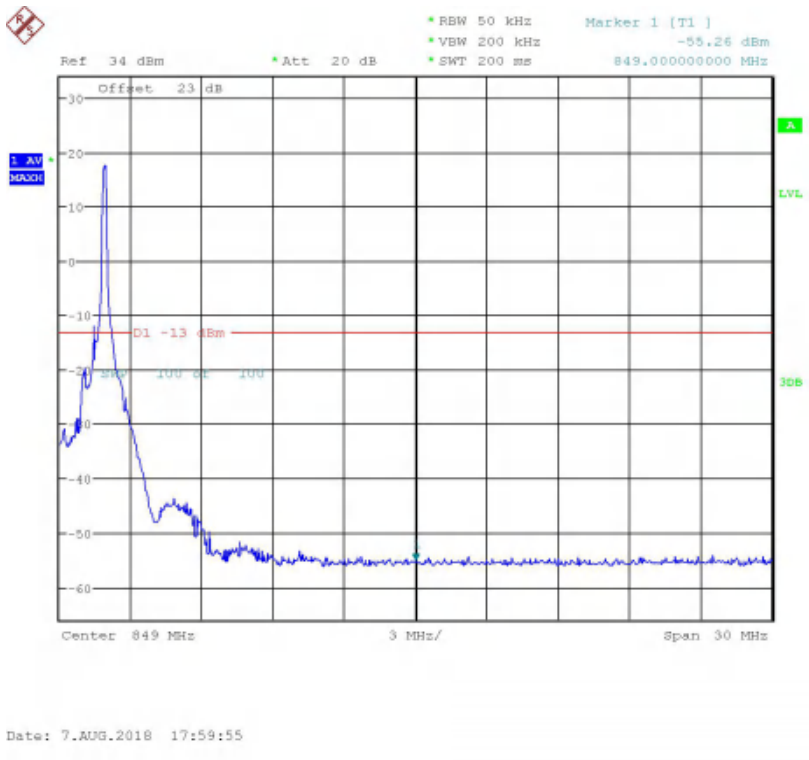
Band26-High Channel-10MHz Bandwidth-6RB-16QAM



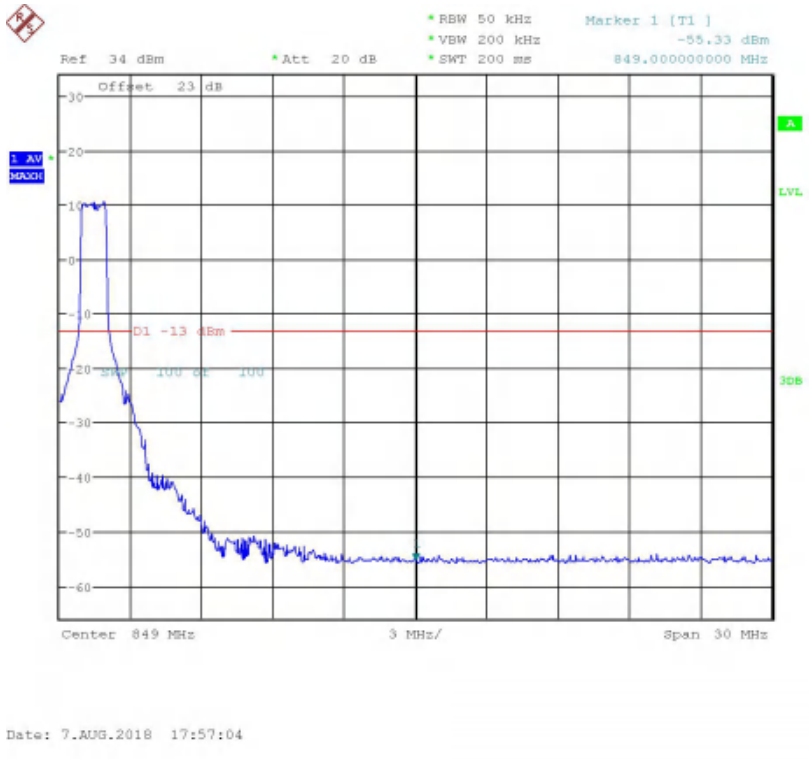
Band26-High Channel-10MHz Bandwidth-6RB-QPSK



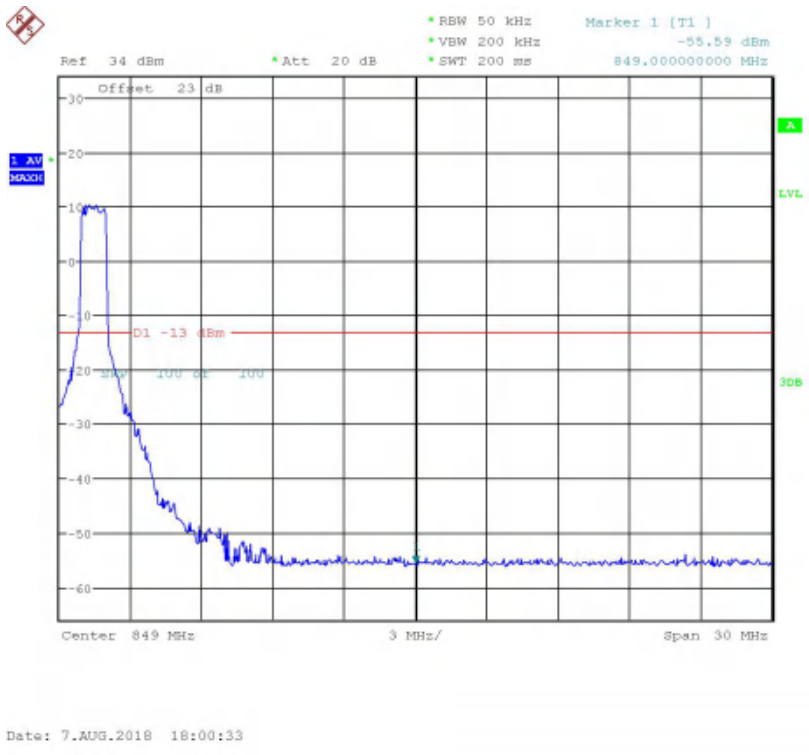
Band26-High Channel-15MHz Bandwidth-1RB-16QAM



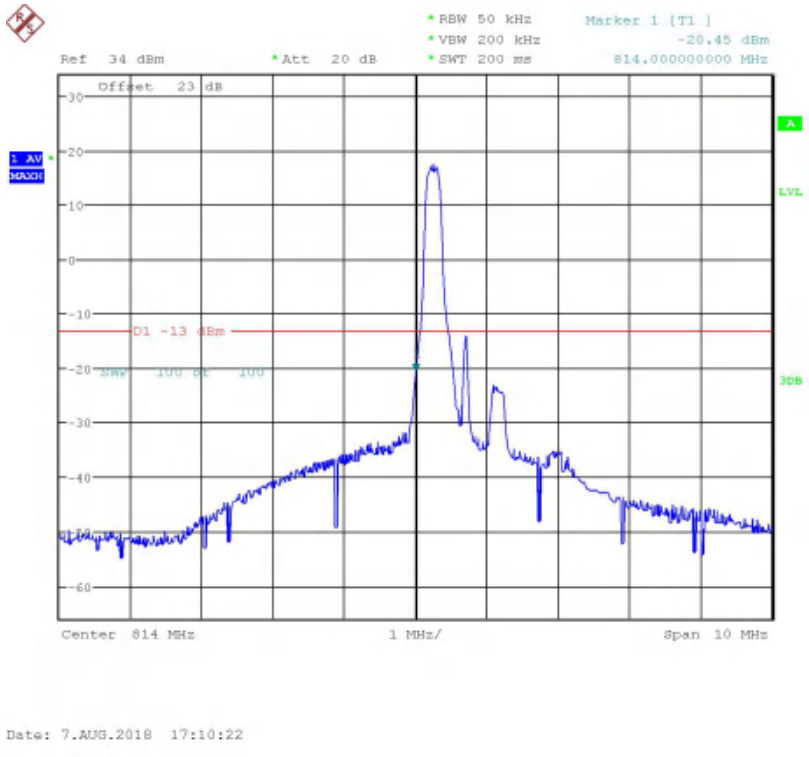
Band26-High Channel-15MHz Bandwidth-1RB-QPSK



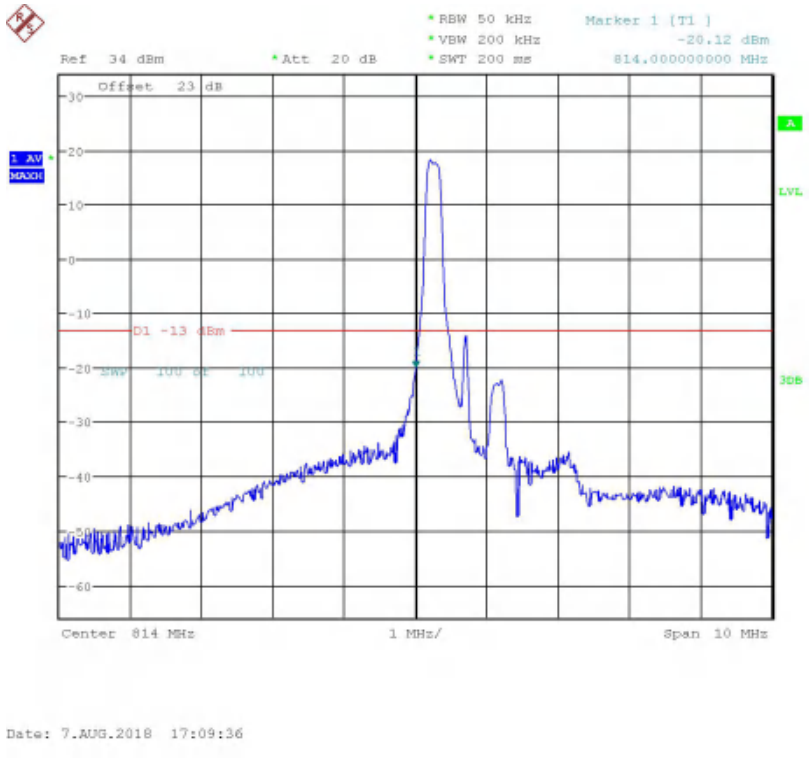
Band26-High Channel-15MHz Bandwidth-6RB-16QAM



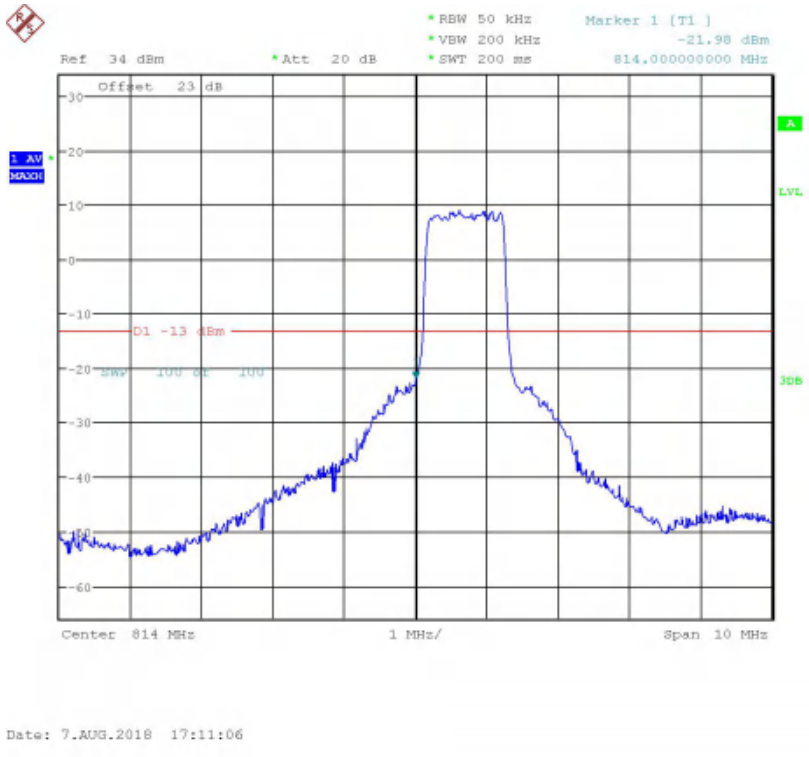
Band26-High Channel-15MHz Bandwidth-6RB-QPSK



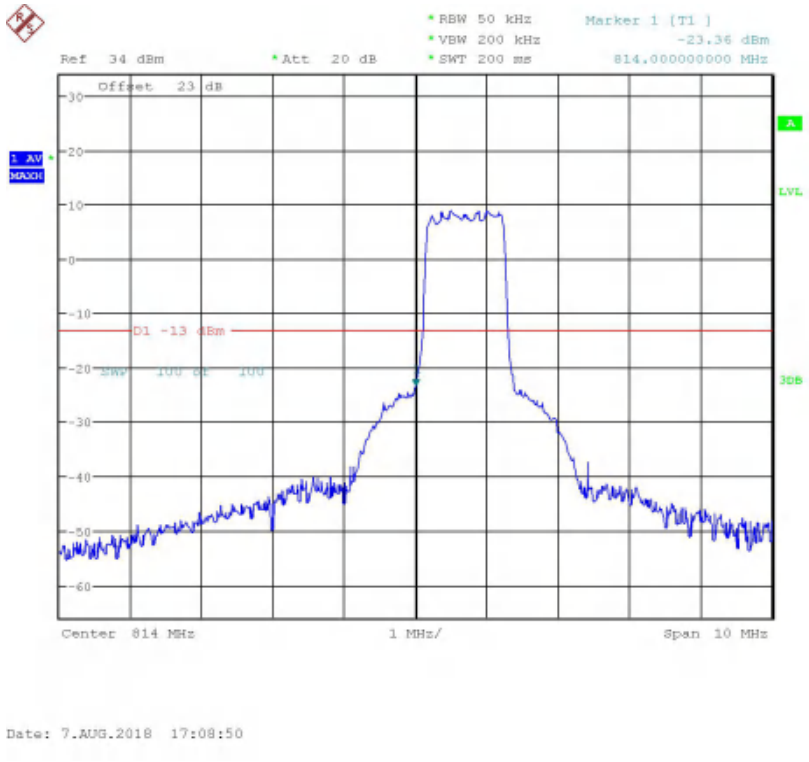
Band26-Low Channel-1.4MHz Bandwidth-1RB-16QAM



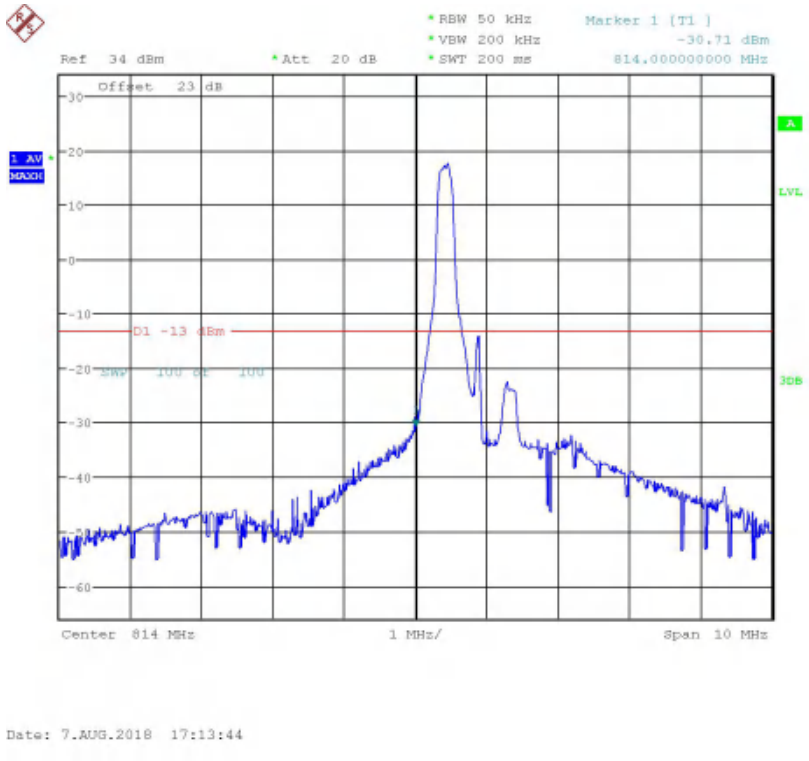
Band26-Low Channel-1.4MHz Bandwidth-1RB-QPSK



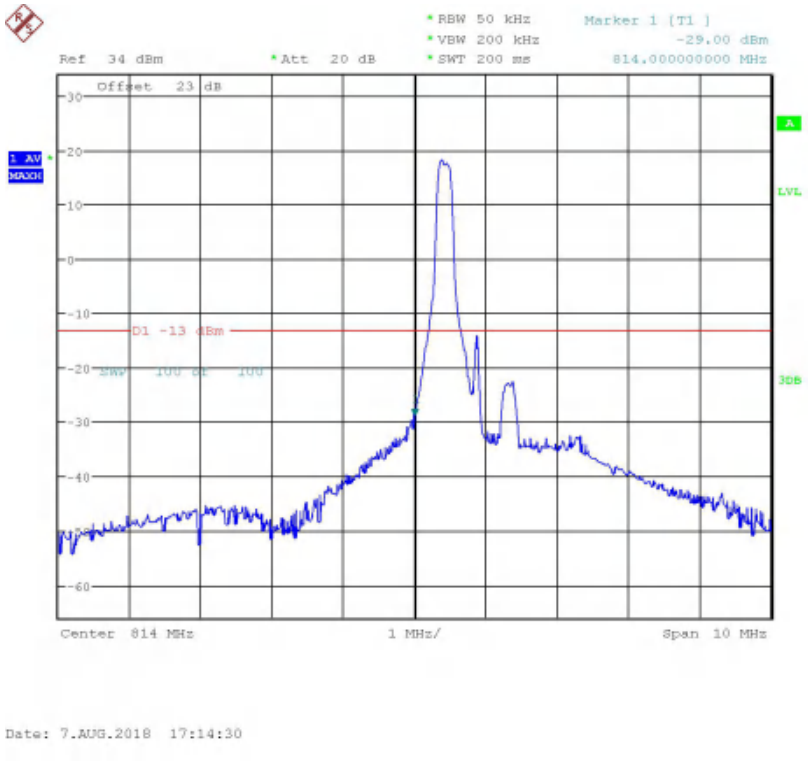
Band26-Low Channel-1.4MHz Bandwidth-6RB-16QAM



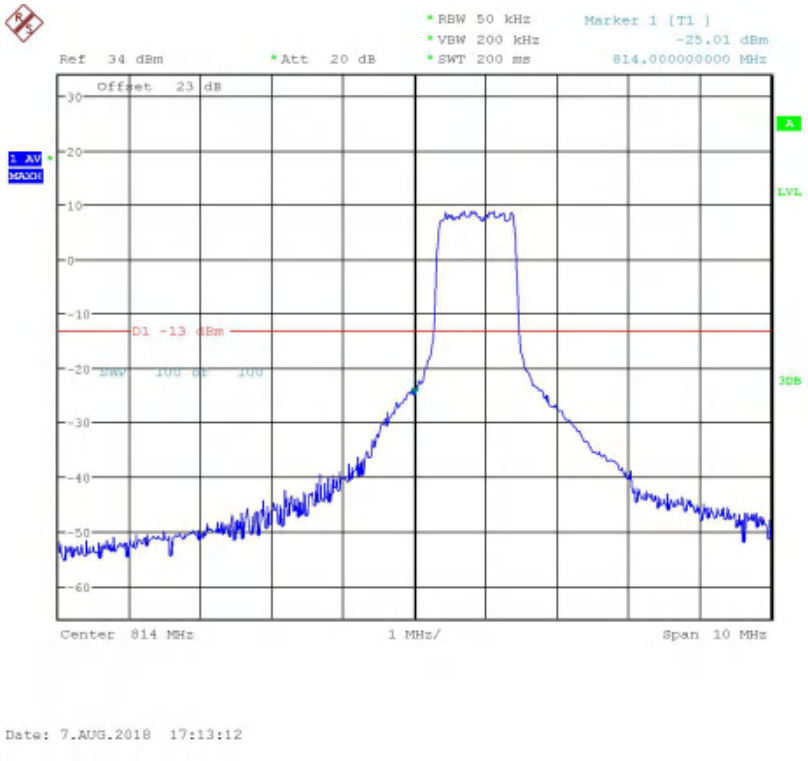
Band26-Low Channel-1.4MHz Bandwidth-6RB-QPSK



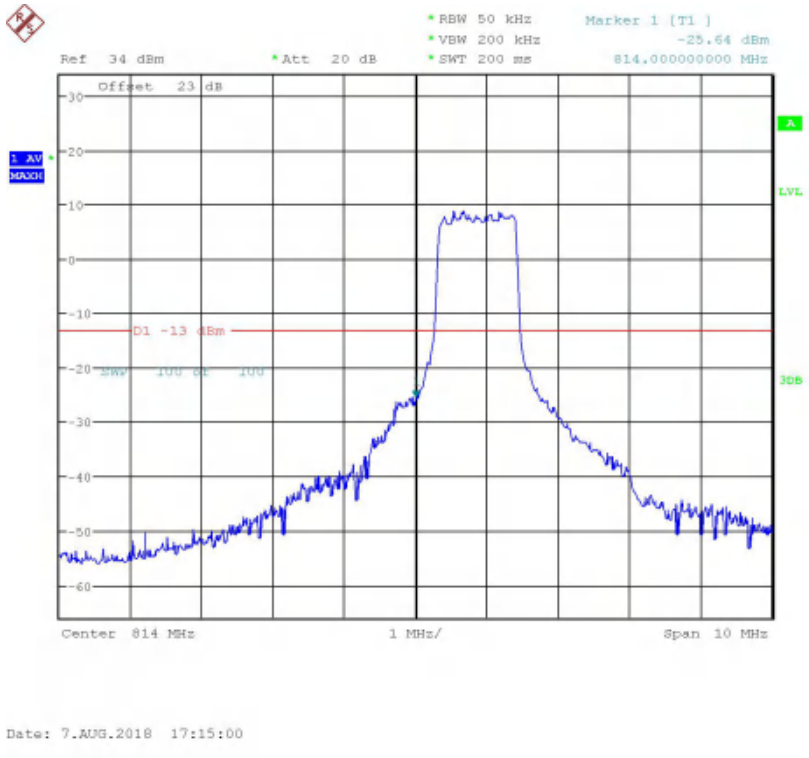
Band26-Low Channel-3MHz Bandwidth-1RB-16QAM



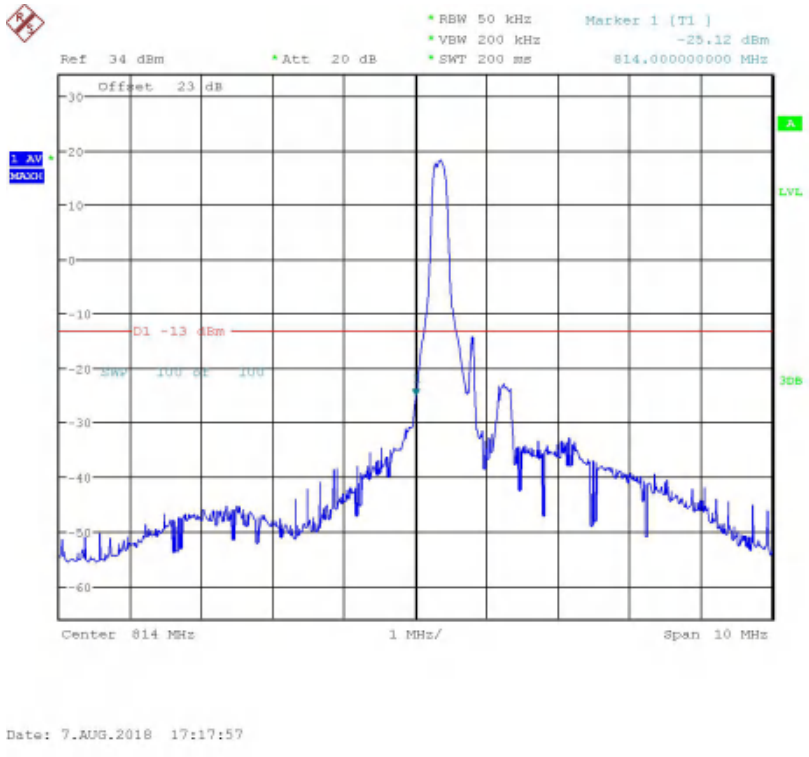
Band26-Low Channel-3MHz Bandwidth-1RB-QPSK



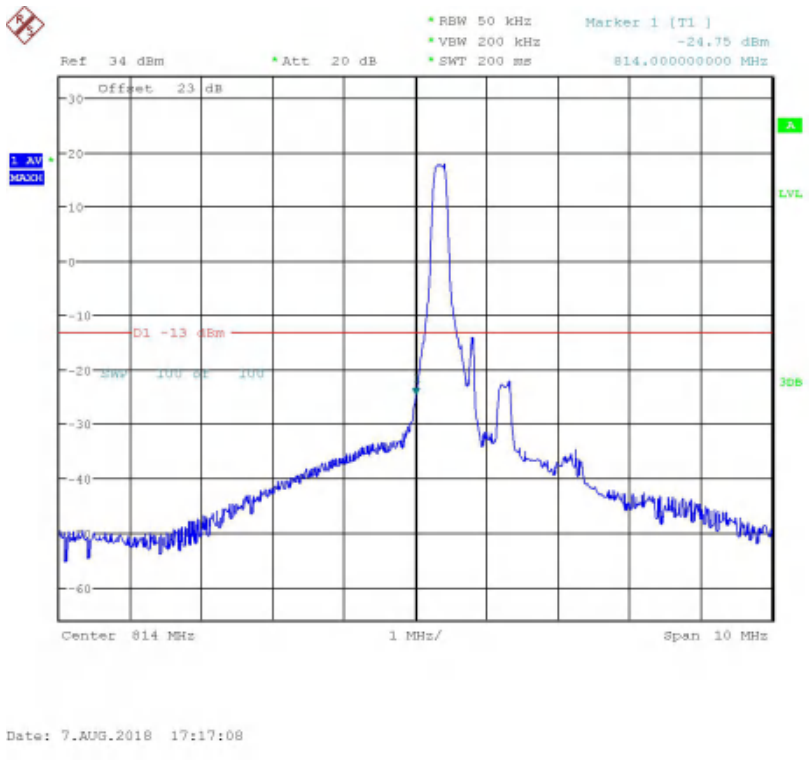
Band26-Low Channel-3MHz Bandwidth-6RB-16QAM



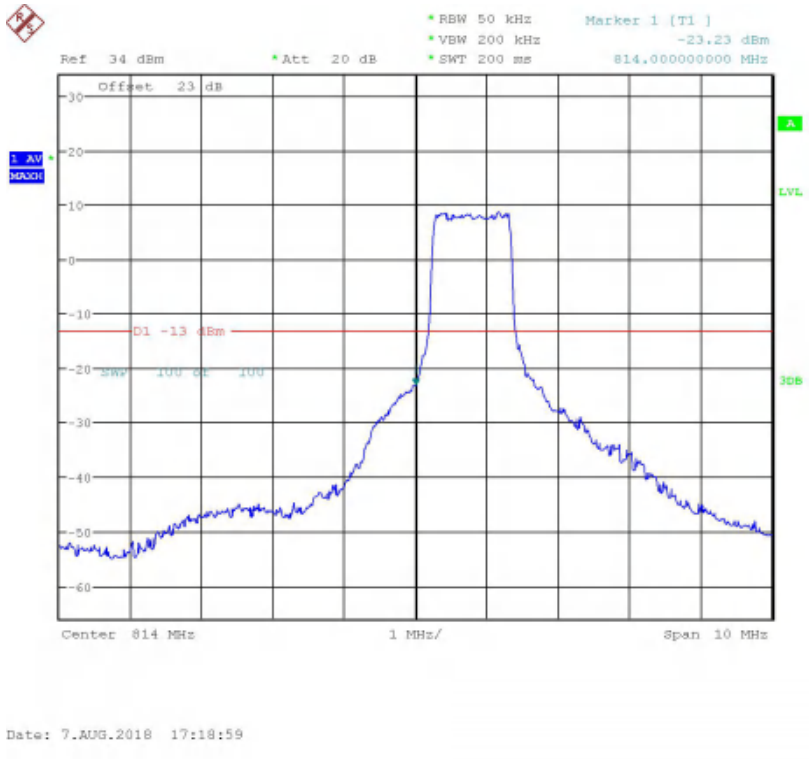
Band26-Low Channel-3MHz Bandwidth-6RB-QPSK



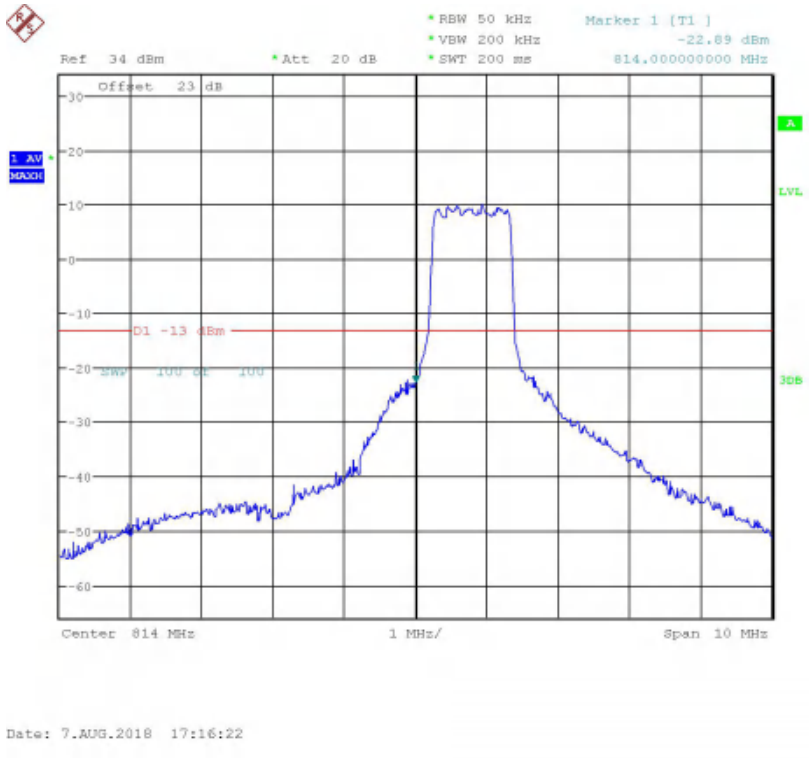
Band26-Low Channel-5MHz Bandwidth-1RB-16QAM



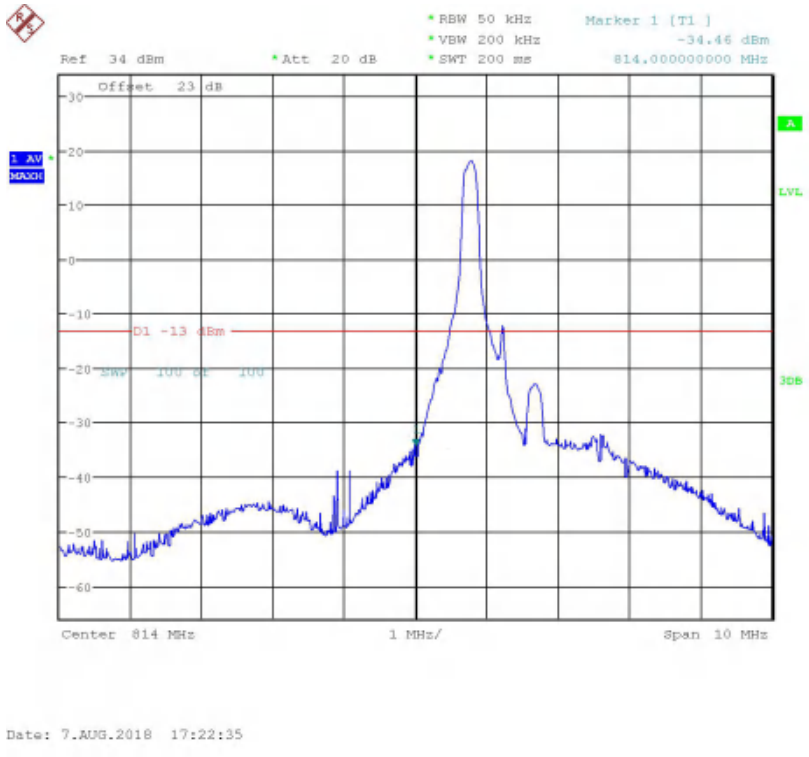
Band26-Low Channel-5MHz Bandwidth-1RB-QPSK



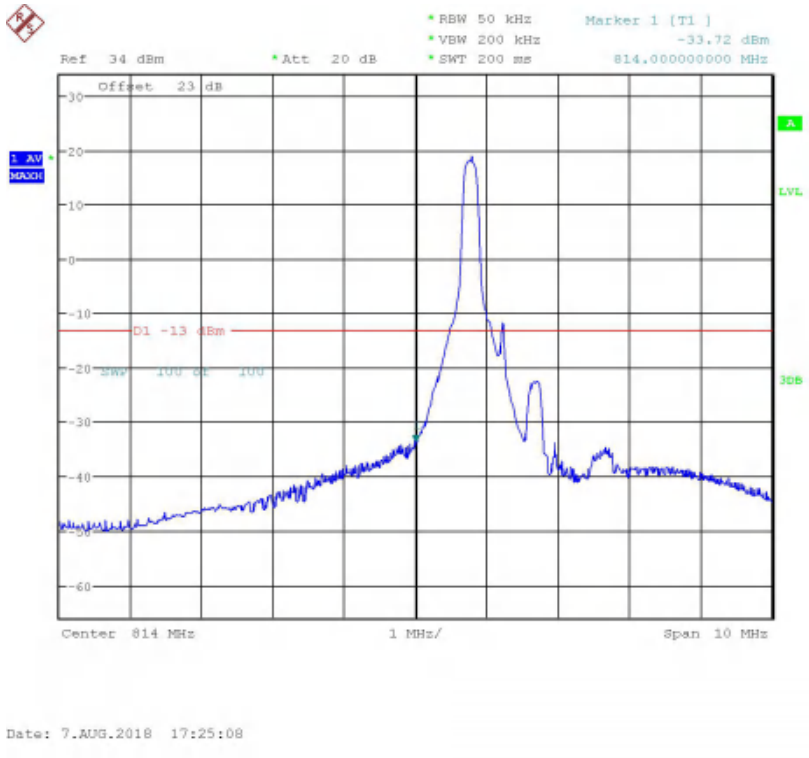
Band26-Low Channel-5MHz Bandwidth-6RB-16QAM



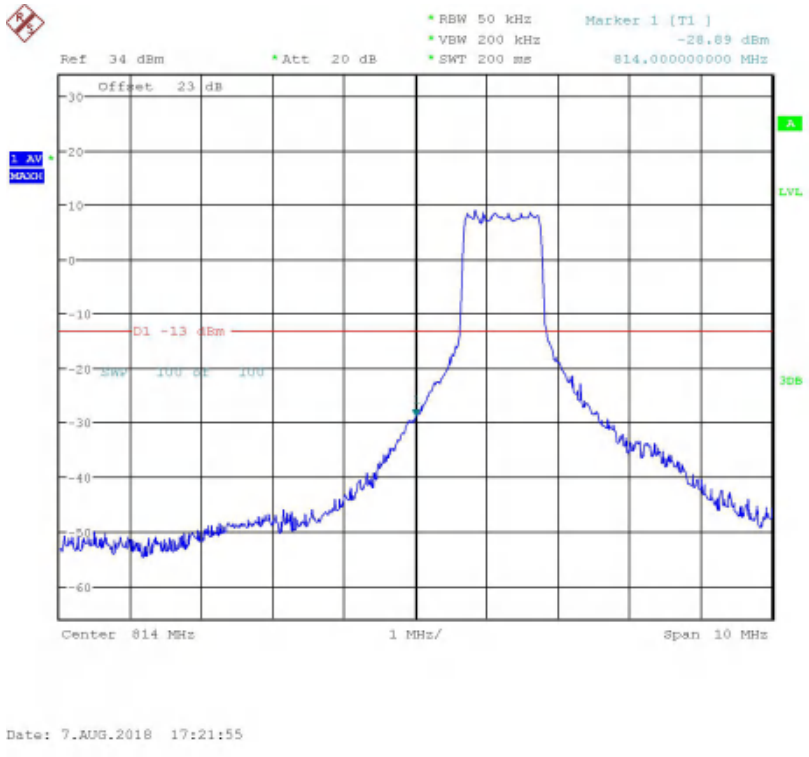
Band26-Low Channel-5MHz Bandwidth-6RB-QPSK



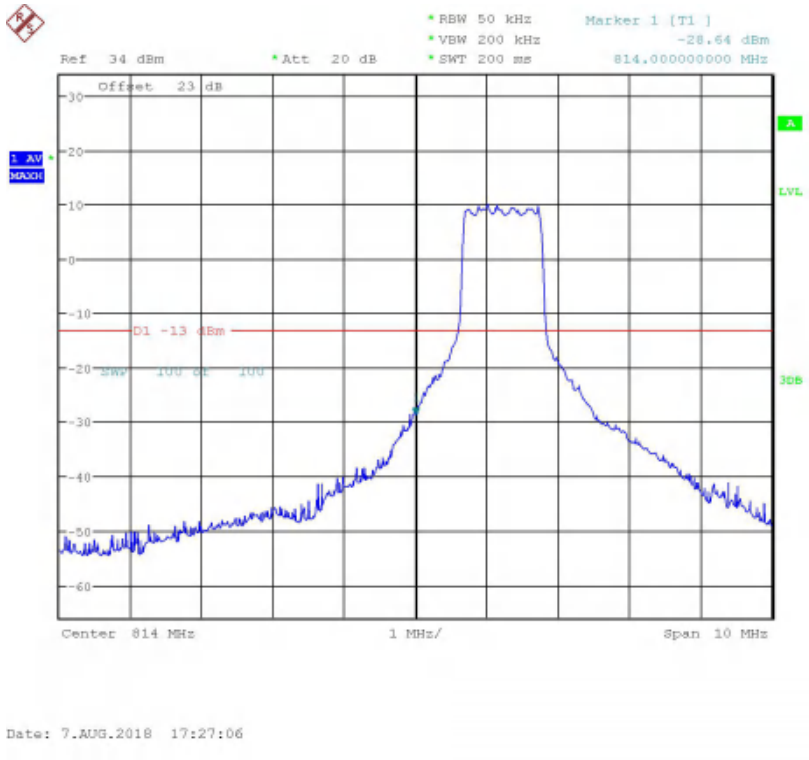
Band26-Low Channel-10MHz Bandwidth-1RB-16QAM



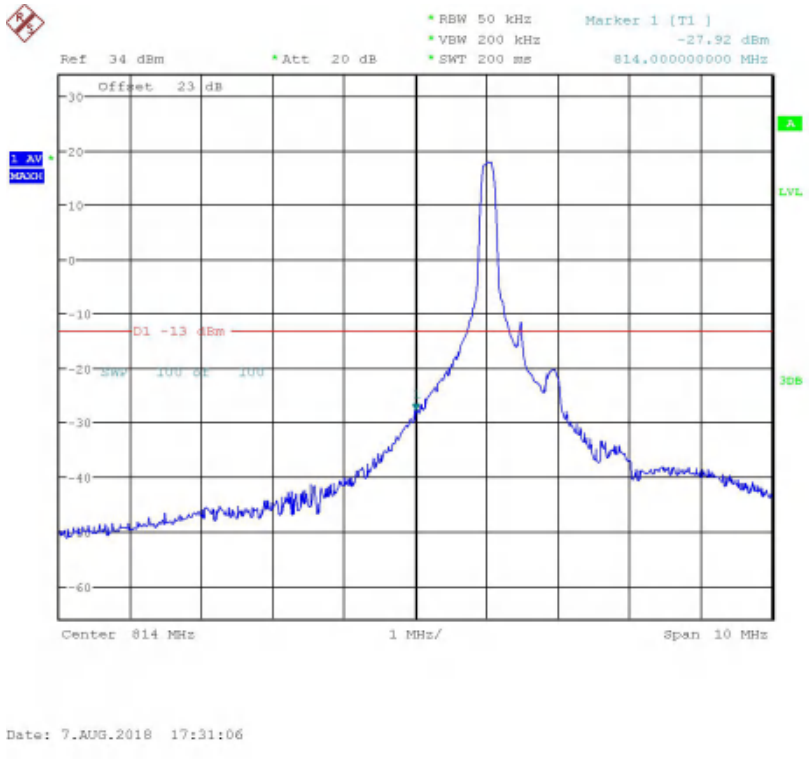
Band26-Low Channel-10MHz Bandwidth-1RB-QPSK



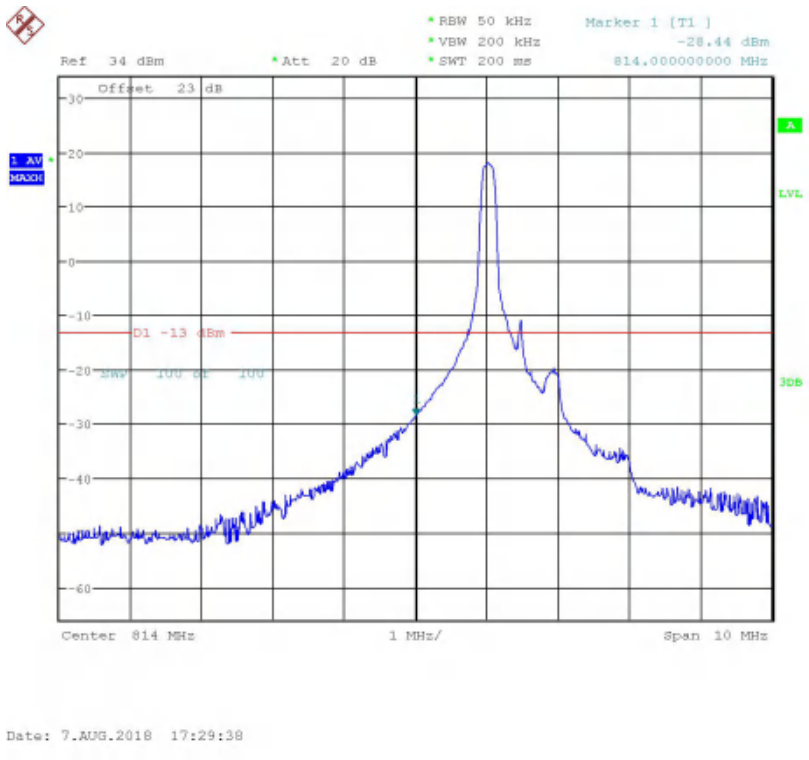
Band26-Low Channel-10MHz Bandwidth-6RB-16QAM



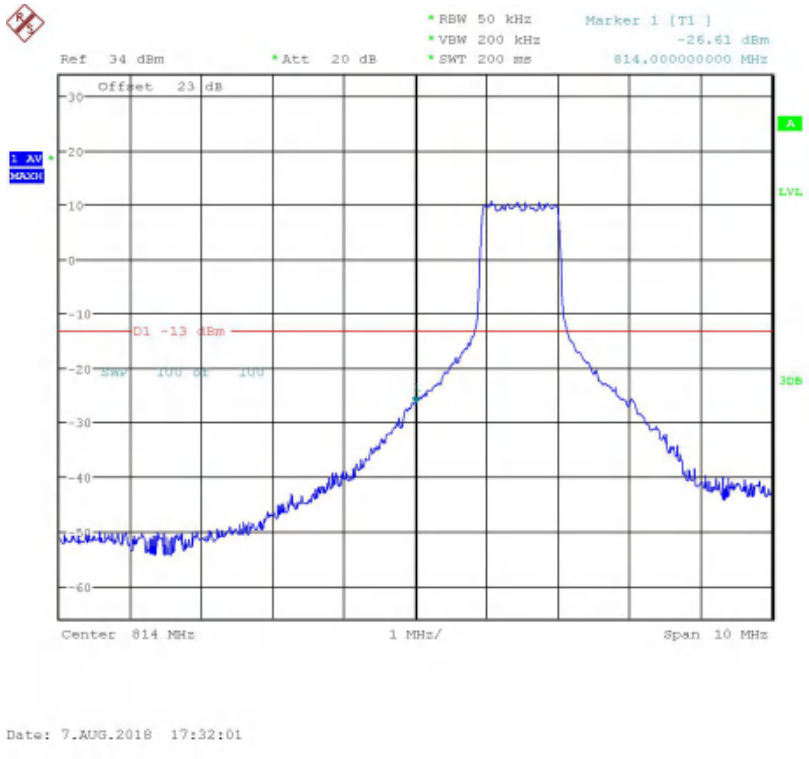
Band26-Low Channel-10MHz Bandwidth-6RB-QPSK



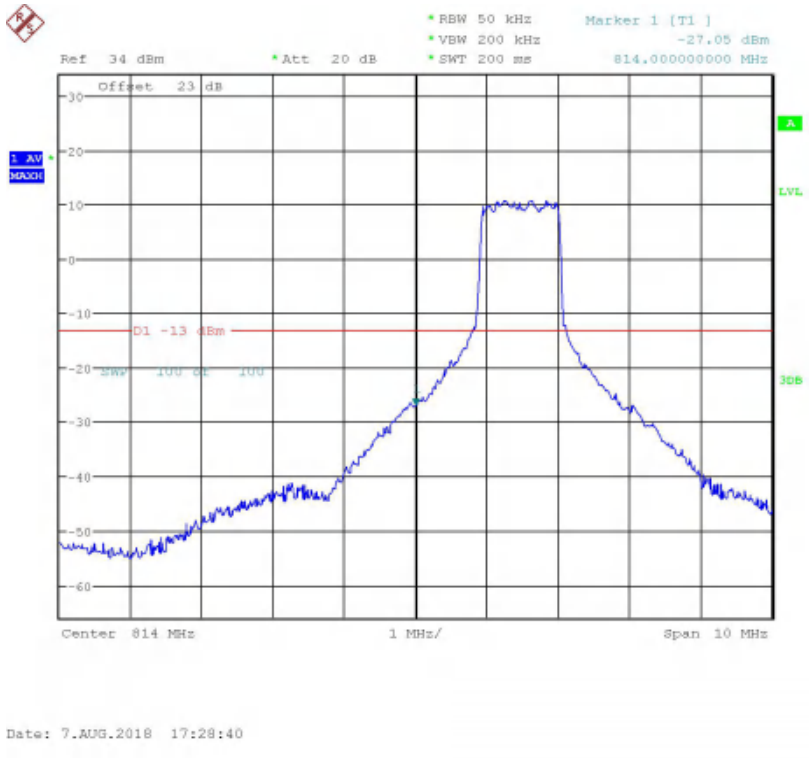
Band26-Low Channel-15MHz Bandwidth-1RB-16QAM



Band26-Low Channel-15MHz Bandwidth-1RB-QPSK



Band26-Low Channel-15MHz Bandwidth-6RB-16QAM



Band26-Low Channel-15MHz Bandwidth-6RB-QPSK

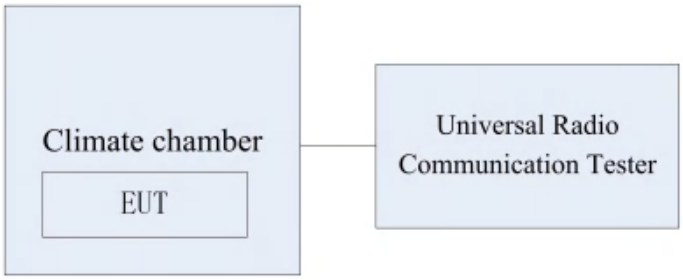
5.6 Frequency Stability over Temperature Variation

Specifications:	FCC Part 2.1055, 22.355, 24.235, 27.54
DUT Serial Number:	S1: D20618181ACDFF4
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	--

Limit	
Frequency deviation [ppm]	±2.5

Test Setup

The EUT was placed in a temperature chamber, demonstrated as figure T. The Wireless Telecommunications Test Set was used to set the Tx channel and power level, modulate the TX signal with different bit patterns and measure the frequency of Tx.



Test Method

1、 The EUT was turned off and placed in the temperature chamber.

2、 The temperature of the chamber was set to -30℃ and allowed to stabilize.

3、 The EUT temperature was allowed to stabilize for 45 minutes.

4、 The EUT was turned on and set to transmit with Wireless Telecommunications Test Set.

5、 The maximum transmit frequency deviation during one minute period was measured by Wireless Communications Test Set.

6、 The steps 3-5 were repeated for -30℃,-20℃, -10℃, 0℃, 10℃, 20℃, 30℃, 40℃ and 50℃.

5.6.1 GSM Band Frequency Stability over Temperature Variation Results

Band	Offset	Temperature[℃]								
		-30	-20	-10	0	10	20	30	40	50
GSM850 GMSK	Hz	17.61	-18.11	5.83	10.01	-2.12	3.01	-4.11	-3.08	8.78
	ppm	0.021	-0.022	0.007	0.012	-0.003	0.004	-0.005	-0.004	0.010
GSM850 8PSK	Hz	-13.55	-14.20	4.08	-6.55	7.14	2.08	4.44	6.17	-7.02
	ppm	-0.016	-0.017	0.005	-0.008	0.009	0.002	0.005	0.007	-0.008
PCS1900 GMSK	Hz	11.51	-10.98	5.71	4.30	-5.00	3.89	-1.42	-4.57	5.11
	ppm	0.006	-0.006	0.003	0.002	-0.003	0.002	-0.001	-0.002	0.003
PCS1900 8PSK	Hz	-10.00	-9.71	6.87	3.32	-5.61	-2.10	1.11	-5.10	-3.26
	ppm	-0.005	-0.005	0.004	0.002	-0.003	-0.001	0.001	-0.003	-0.002

5.6.2 NB-IoT Band Frequency Stability over Temperature Variation Results

Band	Offset	Temperature[℃]								
		-30	-20	-10	0	10	20	30	40	50
2	Hz	-6.54	-8.80	6.54	-3.88	4.61	-3.81	3.22	3.00	1.49
	ppm	-0.003	-0.005	0.003	-0.002	0.002	-0.002	0.002	0.002	0.001
12	Hz	-12.11	-13.64	13.55	-10.01	-5.30	-1.33	4.00	8.62	11.71
	ppm	-0.019	-0.019	0.019	-0.014	-0.007	-0.002	0.006	0.012	0.017
13	Hz	-1.00	-3.04	1.20	-5.08	-6.78	-5.22	9.18	5.11	-7.02
	ppm	-0.001	-0.004	0.002	-0.006	-0.009	-0.007	0.012	0.007	-0.009
17	Hz	-6.11	-5.86	-3.00	1.57	-8.91	-6.20	7.01	9.32	6.97
	ppm	-0.009	-0.008	-0.004	0.002	-0.013	-0.009	0.010	0.013	0.010
26	Hz	-13.11	-18.64	12.52	-9.51	-3.60	-5.33	4.12	8.87	11.72
	ppm	-0.016	-0.022	0.015	-0.011	-0.004	-0.006	0.005	0.011	0.014

5.6.3 CAT-M Band Frequency Stability over Temperature Variation Results

Band	Offset	Temperature[℃]								
		-30	-20	-10	0	10	20	30	40	50
2	Hz	8.18	-5.62	-4.71	9.19	9.16	-4.89	5.39	-8.92	5.71
	ppm	0.004	-0.003	-0.003	0.005	0.005	-0.003	0.003	-0.005	0.003
4	Hz	-9.23	-9.84	9.29	-8.37	-5.78	9.88	-6.65	6.88	4.31
	ppm	-0.005	-0.006	0.005	-0.005	-0.003	0.006	-0.004	0.004	0.002
12	Hz	4.15	-6.39	6.85	-8.24	-4.21	5.42	9.43	-9.75	-8.35
	ppm	0.006	-0.009	0.010	-0.012	-0.006	0.008	0.013	-0.014	-0.012
13	Hz	-5.78	-8.52	-6.98	4.34	-9.67	8.17	4.41	9.89	-6.87
	ppm	-0.007	-0.011	-0.010	0.006	-0.012	0.010	0.006	0.013	-0.009
26	Hz	4.65	-9.16	9.19	4.67	-7.31	6.41	-5.64	-7.78	6.91
	ppm	0.006	-0.011	0.011	0.006	-0.009	0.008	-0.007	-0.009	0.008

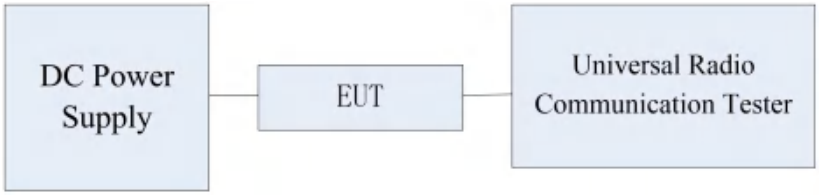
5.7 Frequency Stability over Voltage Variation

Specifications:	FCC Part 2.1055, 22.355, 24.235, 27.54
DUT Serial Number:	S1: D20618181ACDFF4
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	--

Limit	
Frequency deviation [ppm]	±2.5

Test Setup

The EUT was placed in a shielding chamber and powered by an adjustable power supply, demonstrated as figure V. A Wireless Telecommunications Test Set was used to set the TX channel and power level, modulate the TX signal with different bit patterns and measure the frequency of TX.



Test Method

The EUT was powered by the adjustable power supply. The frequency stability is measured by the Wireless Telecommunications Test Set.

5.7.1 GSM Band Frequency Stability over Voltage Variation Results

Test data：

Band	**Offset**	**Voltage (V)**		
		3.0	**3.8**	**4.3**
GSM850 GMSK	Hz	3.61	-1.01	3.41
	ppm	0.004	-0.001	0.004
GSM850 8PSK	Hz	-5.60	-0.78	2.30
	ppm	-0.007	-0.001	0.003
PCS1900 GMSK	Hz	1.09	1.77	-1.56
	ppm	0.001	0.001	-0.001
PCS1900	Hz	2.11	-0.11	-4.01

8PSK	ppm	0.001	-0.001	-0.002

5.7.2 NB-IoT Band Frequency Stability over Voltage Variation Results

Test data:

Band	Offset	Voltage (V)		
		3.0	**3.8**	**4.3**
2	**Hz**	-4.77	-4.84	9.74
	ppm	-0.003	-0.003	0.005
12	**Hz**	7.64	-4.83	-6.23
	ppm	0.011	-0.007	-0.009
13	**Hz**	-7.75	-6.23	5.18
	ppm	-0.010	-0.008	0.007
17	**Hz**	5.69	-6.91	-7.85
	ppm	0.008	-0.010	-0.011
26	**Hz**	4.44	4.79	-6.44
	ppm	0.005	0.006	-0.008

5.7.3 CAT-M Band Frequency Stability over Voltage Variation Results

Test data:

Band	Offset	Voltage (V)		
		3.0	**3.8**	**4.3**
2	**Hz**	-5.55	-4.68	7.46
	ppm	-0.003	-0.002	-0.004
4	**Hz**	4.21	-9.72	-5.68
	ppm	0.002	-0.006	-0.003
12	**Hz**	-9.22	-5.89	7.47
	ppm	-0.013	-0.008	0.011
13	**Hz**	-6.74	4.99	6.36
	ppm	-0.009	0.006	-0.008
26	**Hz**	-5.85	-5.33	-4.89
	ppm	-0.007	-0.006	-0.006

5.8 Peak to Average Ratio

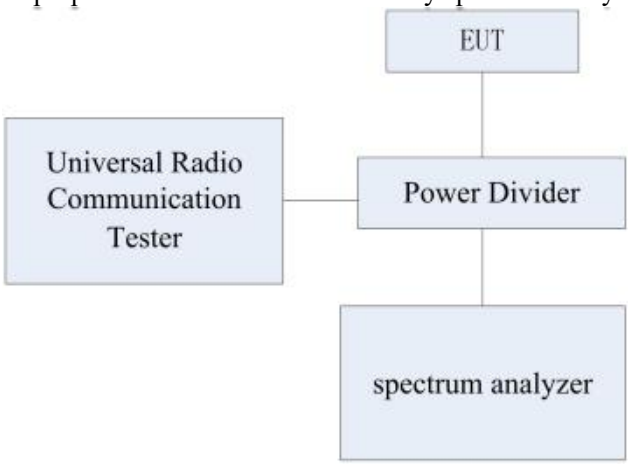
Specifications:	FCC Part 24.232, 27.50,
DUT Serial Number:	S1: D20618181ACDFF4
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	--

Limit

The EUT meets the requirement of having a peak to average ratio of less than 13dB.

Test Setup

During the test, the EUT was controlled via the Wireless Communications Test Set to ensure max power transmission and proper modulation and measured by spectrum analyzer.



Test Method

The transmitter output was connected to a CMW500 through a coaxial RF cable and directional coupler, and configured to operate at maximum power. The peak to average ratio was measured at the required operating frequencies in each Band on the Spectrum Analyzer.

5.8.1 GSM850 Peak to Average Ratio Results

Frequency (MHz)	Channel	Modulation	PAPR(dB)
836.6	190	GMSK	11.4
		8PSK	11.2

5.8.2 PCS1900 Peak to Average Ratio Results

Frequency (MHz)	Channel	Modulation	PAPR(dB)
1880	661	GMSK	11.4
		8PSK	11.1

5.8.3 NB-IoT Peak to Average Ratio Results

Mode	Channel	Frequency (MHz)	PAPR(dB)	PAPR(dB)
			QPSK	BPSK
Band2	18900	1880	3.7	7.0
Band12	23095	707.5	4.9	8.1
Band13	23230	782	7.1	7.1
Band17	23790	710	7.3	7.0
Band26	26865	831.5	6.9	5.9

Mode	Channel	Frequency (MHz)	PAPR(dB)
Band12	23179	715.9	7.2
Note:Only the worst value of 715.9			

5.8.4 CAT-M Peak to Average Ratio Results

Mode	Bandwidth	Modulation	Channel/Frequency（MHz）	PAPR（dB）
Band2	1.4MHz	QPSK	18900/1880	12.1
		16QAM	18900/1880	12.2
	3MHz	QPSK	18900/1880	12.8
		16QAM	18900/1880	12.0
	5MHz	QPSK	18900/1880	12.9
		16QAM	18900/1880	11.2
	10MHz	QPSK	18900/1880	9.7
		16QAM	18900/1880	10.1
	15MHz	QPSK	18900/1880	11.5
		16QAM	18900/1880	10.3
	20MHz	QPSK	18900/1880	9.1
		16QAM	18900/1880	7.0

Mode	Bandwidth	Modulation	Channel/Frequency（MHz）	PAPR（dB）
Band4	1.4MHz	QPSK	20175/1732.5	9.9
		16QAM	20175/1732.5	11.4
	3MHz	QPSK	20175/1732.5	10.6
		16QAM	20175/1732.5	10.7
	5MHz	QPSK	20175/1732.5	10.3
		16QAM	20175/1732.5	9.3
	10MHz	QPSK	20175/1732.5	6.8

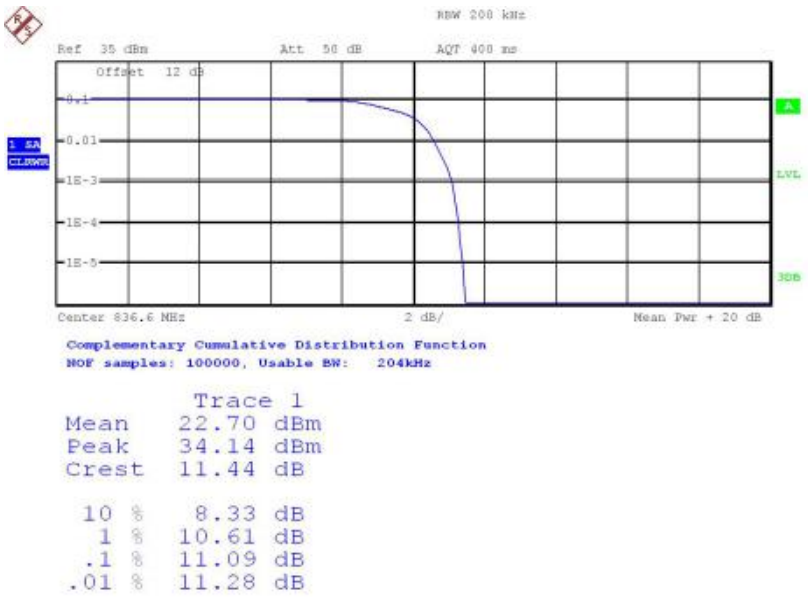
		16QAM	20175/1732.5	7.8
	15MHz	QPSK	20175/1732.5	10.0
		16QAM	20175/1732.5	7.3
	20MHz	QPSK	20175/1732.5	7.3
		16QAM	20175/1732.5	6.5

Mode	Bandwidth	Modulation	Channel/Frequency（MHz）	PAPR（dB）
Band12	1.4MHz	QPSK	23095/707.5	11.2
		16QAM	23095/707.5	11.8
	3MHz	QPSK	23095/707.5	10.0
		16QAM	23095/707.5	10.6
	5MHz	QPSK	23095/707.5	9.3
		16QAM	23095/707.5	11.9
	10MHz	QPSK	23095/707.5	8.7
		16QAM	23095/707.5	9.3

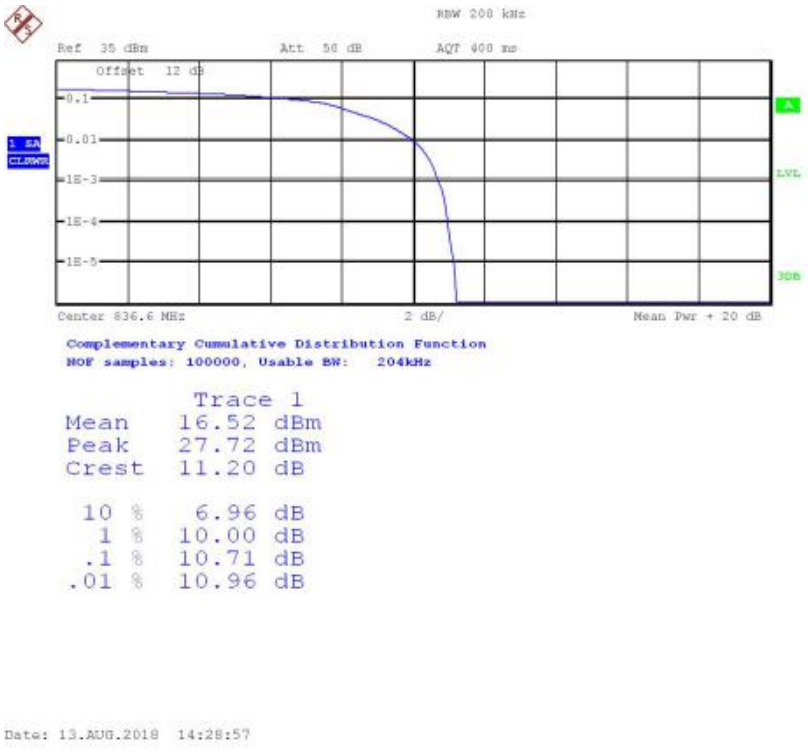
Mode	Bandwidth	Modulation	Channel/Frequency（MHz）	PAPR（dB）
Band13	5MHz	QPSK	23230/782	11.2
		16QAM	23230/782	12.9
	10MHz	QPSK	23230/782	9.4
		16QAM	23230/782	11.0

Mode	Bandwidth	Modulation	Channel/Frequency（MHz）	PAPR（dB）
Band26	1.4MHz	QPSK	26865/831.5	12.4
		16QAM	26865/831.5	12.9
	3MHz	QPSK	26865/831.5	10.7
		16QAM	26865/831.5	11.2
	5MHz	QPSK	26865/831.5	9.3
		16QAM	26865/831.5	12.8
	10MHz	QPSK	26865/831.5	8.7
		16QAM	26865/831.5	9.6
	15MHz	QPSK	26865/831.5	8.4
		16QAM	26865/831.5	11.1

Graphical for Peak to Average Ratio Results for GSM850:

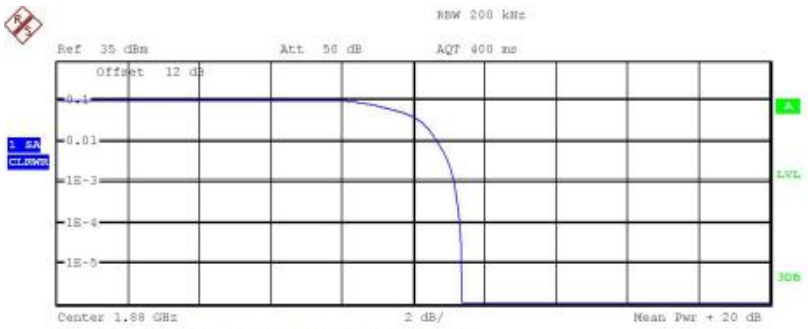


836.6MHz-CH190-GMSK



836.6MHz-CH190-8PSK

Graphical for Peak to Average Ratio Results for PCS1900:



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 204kHz

	Trace 1
Mean	16.31 dBm
Peak	27.65 dBm
Crest	11.35 dB
10 %	8.30 dB
1 %	10.67 dB
.1 %	11.15 dB
.01 %	11.31 dB

Date: 13.AUG.2018 14:32:44

1880MHz-CH661-GMSK

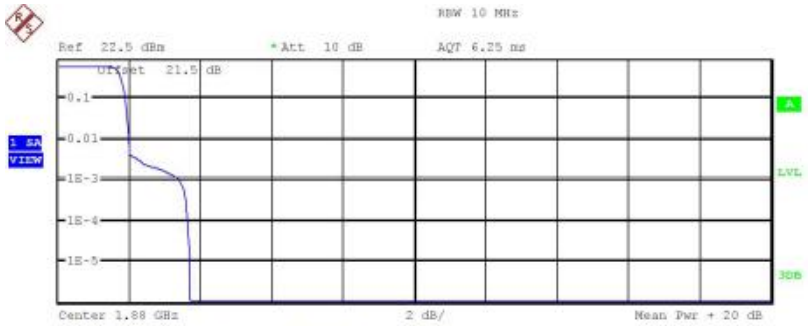
Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 204kHz

	Trace 1
Mean	14.26 dBm
Peak	25.39 dBm
Crest	11.13 dB
10 %	7.02 dB
1 %	9.94 dB
.1 %	10.58 dB
.01 %	10.90 dB

Date: 13.AUG.2018 14:31:36

1880MHz-CH661-8PSK

Graphical for Peak to Average Ratio Results for NB-IoT:

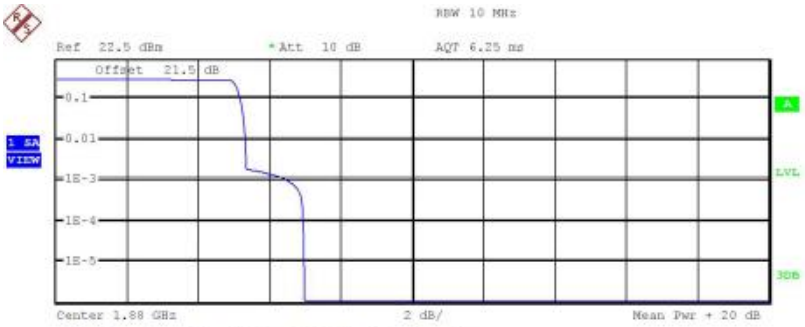


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	18.14 dBm
Peak	21.84 dBm
Crest	3.70 dB
10 %	1.89 dB
1 %	1.99 dB
.1 %	3.40 dB
.01 %	3.65 dB

Date: 5.AUG.2018 22:38:18

Band2-CH18900-1880MHz-QPSK

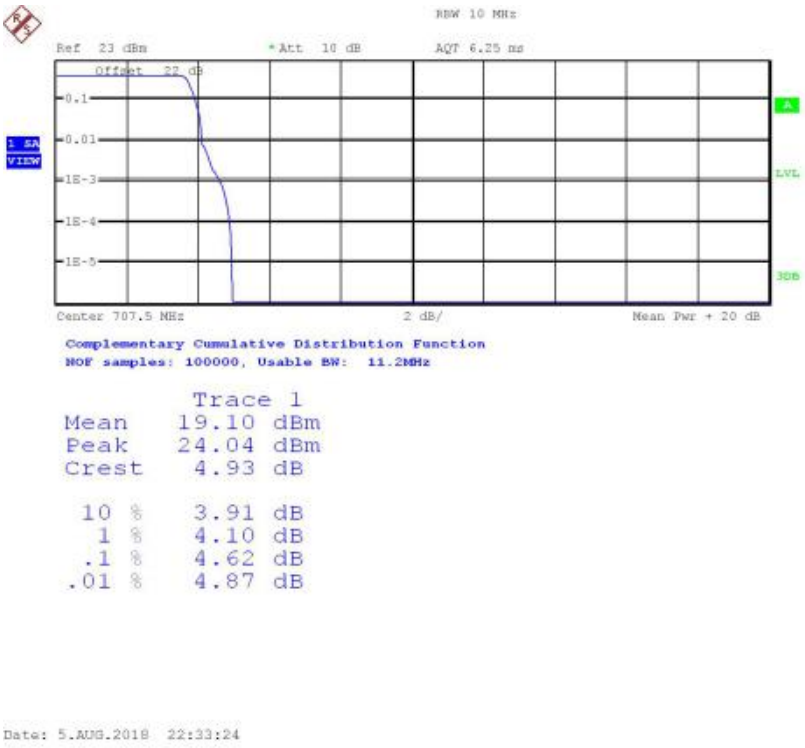


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

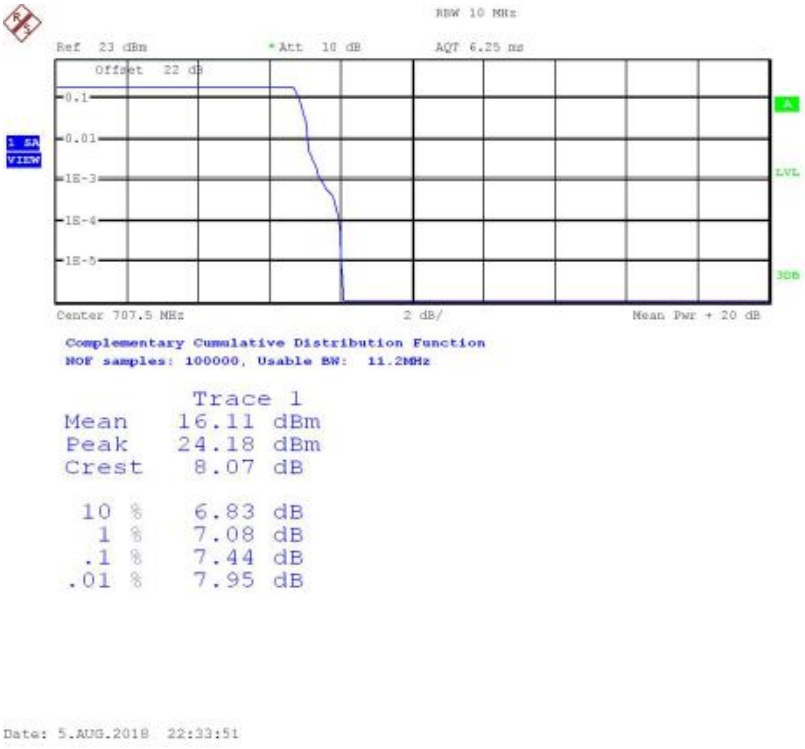
	Trace 1
Mean	14.81 dBm
Peak	21.77 dBm
Crest	6.95 dB
10 %	5.19 dB
1 %	5.32 dB
.1 %	6.51 dB
.01 %	6.96 dB

Date: 5.AUG.2018 22:37:33

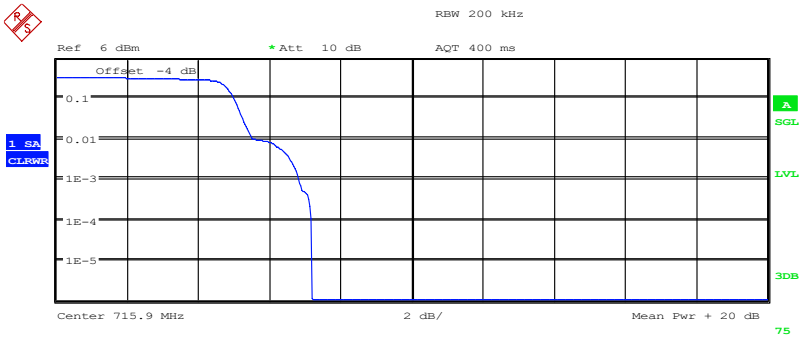
Band2-CH18900-1880MHz-BPSK



Band12-CH23095-707.5MHz -QPSK



Band12-CH23095-707.5MHz -BPSK

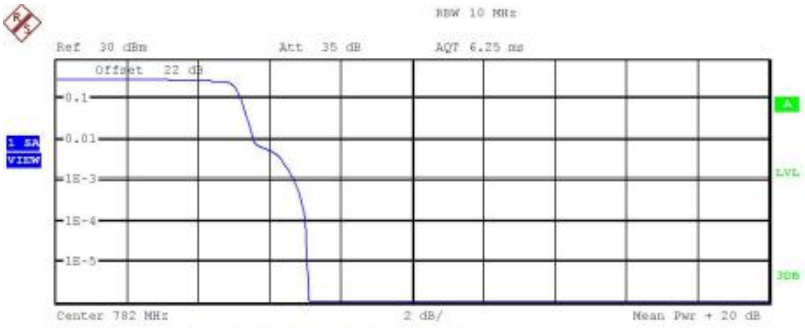


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 204kHz

	Trace 1
Mean	-24.97 dBm
Peak	-17.77 dBm
Crest	7.20 dB
10 %	5.00 dB
1 %	5.61 dB
.1 %	6.83 dB
.01 %	7.18 dB

Date: 15.JAN.2020 11:59:03

Band12-CH23179-715.9MHz

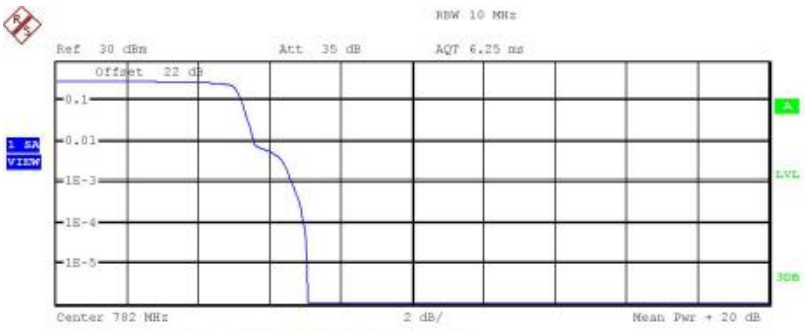


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	17.24 dBm
Peak	24.34 dBm
Crest	7.10 dB
10 %	5.19 dB
1 %	5.54 dB
.1 %	6.70 dB
.01 %	6.99 dB

Date: 5.AUG.2019 21:57:02

Band13-CH23230-782MHz-QPSK

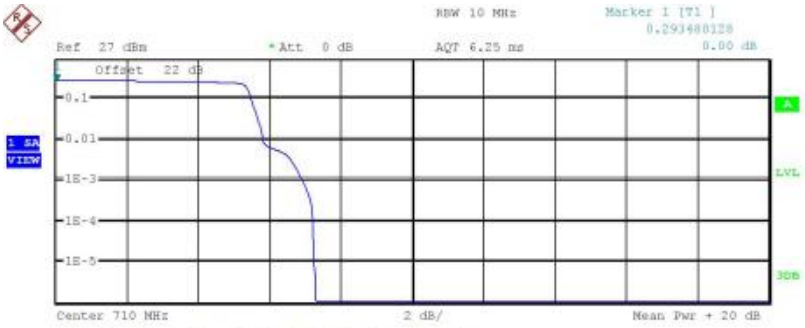


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	17.22 dBm
Peak	24.27 dBm
Crest	7.05 dB
10 %	5.22 dB
1 %	5.54 dB
.1 %	6.63 dB
.01 %	6.96 dB

Date: 5.AUG.2018 21:57:51

Band13-CH23230-782MHz-BPSK

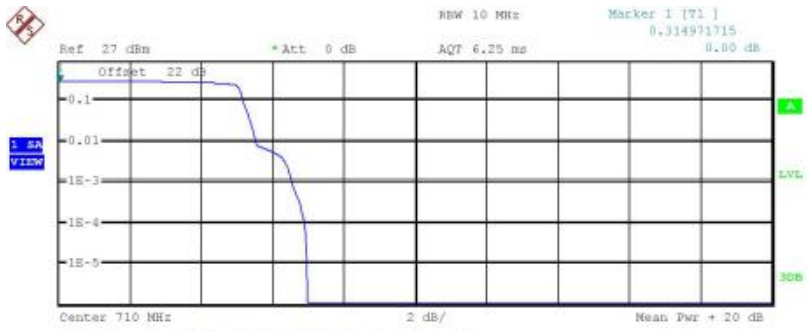


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	16.96 dBm
Peak	24.26 dBm
Crest	7.30 dB
10 %	5.48 dB
1 %	5.83 dB
.1 %	6.92 dB
.01 %	7.21 dB

Date: 5.AUG.2018 21:02:51

Band17-CH23790-710MHz -QPSK

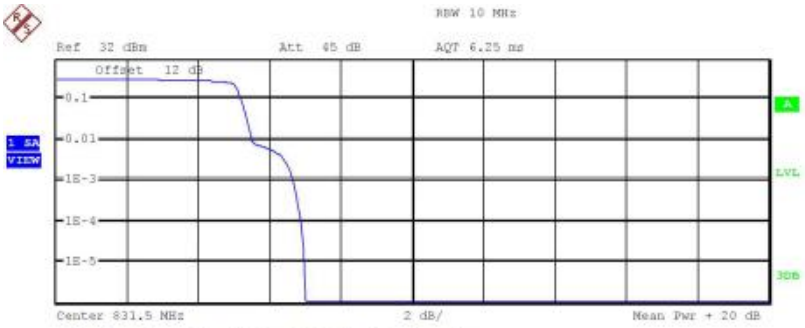


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	17.23 dBm
Peak	24.19 dBm
Crest	6.96 dB
10 %	5.19 dB
1 %	5.54 dB
.1 %	6.54 dB
.01 %	6.89 dB

Date: 5.AUG.2018 21:03:22

Band17-CH23790-710MHz -BPSK

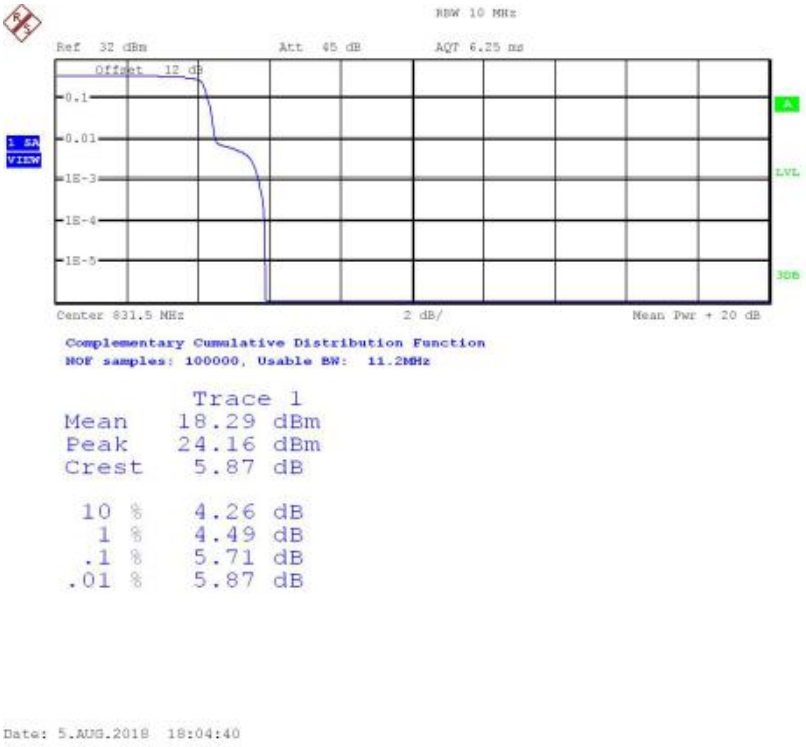


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	17.39 dBm
Peak	24.38 dBm
Crest	6.98 dB
10 %	5.19 dB
1 %	5.51 dB
.1 %	6.67 dB
.01 %	6.89 dB

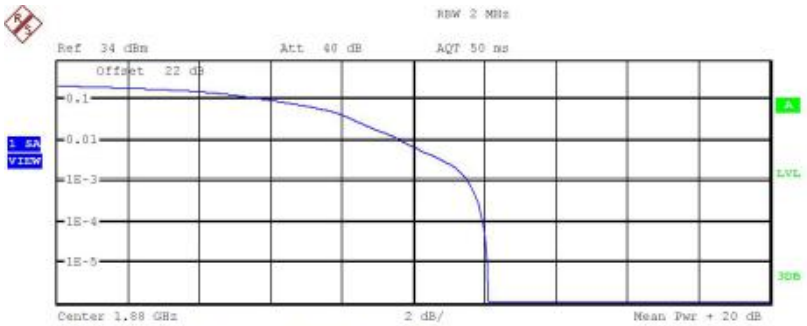
Date: 5.AUG.2018 18:05:43

Band26-CH26865-831.5MHz -QPSK



Band26-CH26865-831.5MHz -BPSK

Graphical for Peak to Average Ratio Results for CAT-M:

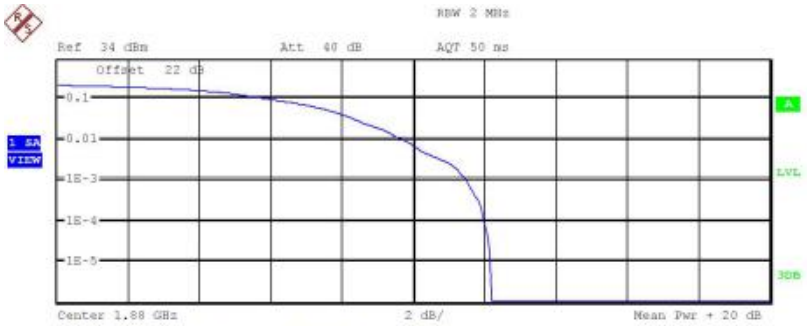


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 1.7MHz

	Trace 1
Mean	12.94 dBm
Peak	25.03 dBm
Crest	12.09 dB
10 %	6.06 dB
1 %	9.68 dB
.1 %	11.54 dB
.01 %	11.96 dB

Date: 8.AUG.2018 13:48:44

Band2-CH18900-1880MHz-1.4MHz Bandwidth-QPSK

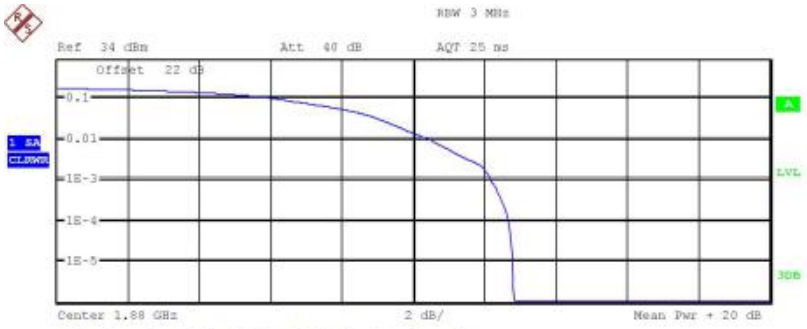


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 1.7MHz

	Trace 1
Mean	12.86 dBm
Peak	25.03 dBm
Crest	12.17 dB
10 %	6.03 dB
1 %	9.71 dB
.1 %	11.51 dB
.01 %	11.99 dB

Date: 8.AUG.2018 13:49:17

Band2-CH18900-1880MHz-1.4MHz Bandwidth-16QAM

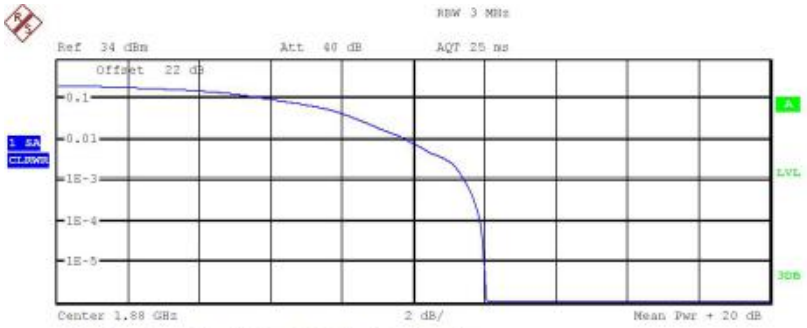


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 3.5MHz

	Trace 1
Mean	12.58 dBm
Peak	25.38 dBm
Crest	12.80 dB
10 %	6.28 dB
1 %	10.48 dB
.1 %	12.18 dB
.01 %	12.66 dB

Date: 8.AUG.2018 13:47:24

Band2-CH18900-1880MHz-3MHz Bandwidth-QPSK

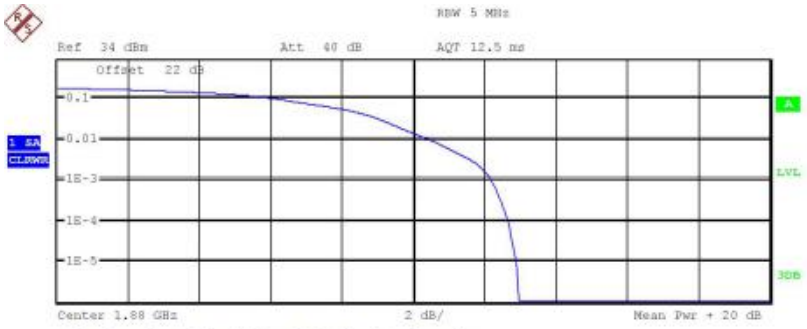


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 3.5MHz

	Trace 1
Mean	12.70 dBm
Peak	24.75 dBm
Crest	12.04 dB
10 %	6.09 dB
1 %	9.81 dB
.1 %	11.44 dB
.01 %	11.89 dB

Date: 8.AUG.2018 13:47:11

Band2-CH18900-1880MHz-3MHz Bandwidth-16QAM

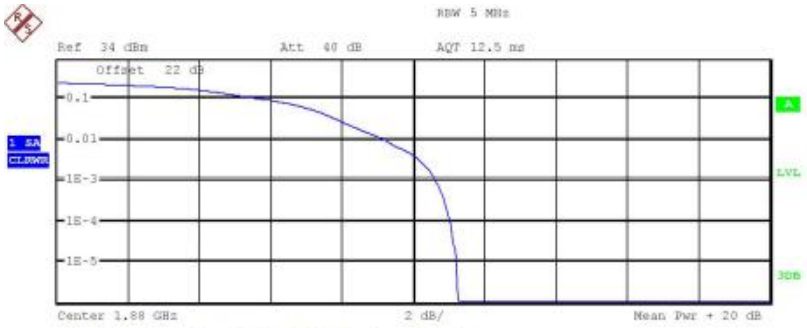


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 7.1MHz

	Trace 1
Mean	11.94 dBm
Peak	24.89 dBm
Crest	12.95 dB
10 %	6.28 dB
1 %	10.48 dB
.1 %	12.21 dB
.01 %	12.66 dB

Date: 8.AUG.2018 13:45:30

Band2-CH18900-1880MHz-5MHz Bandwidth-QPSK

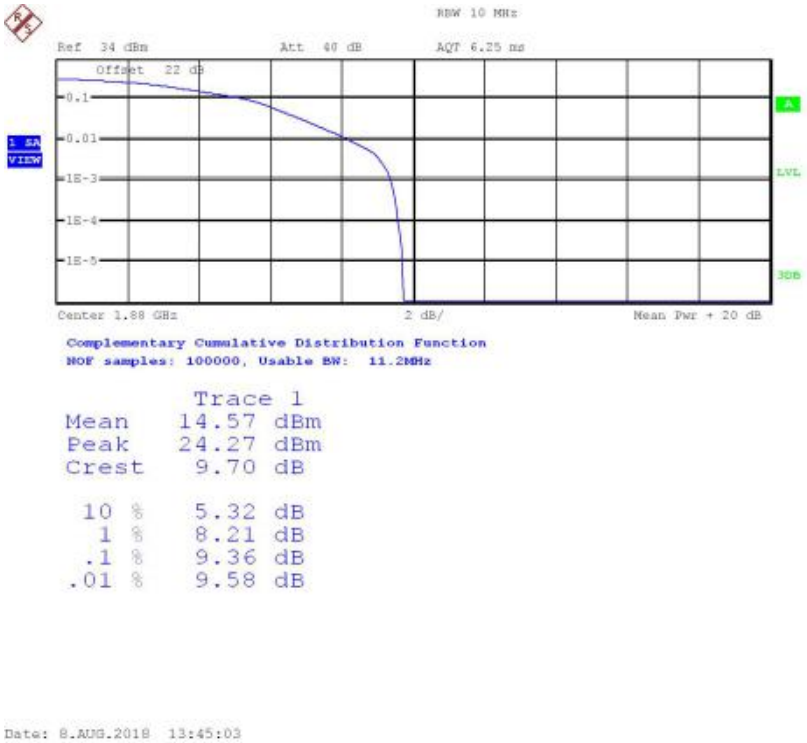


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 7.1MHz

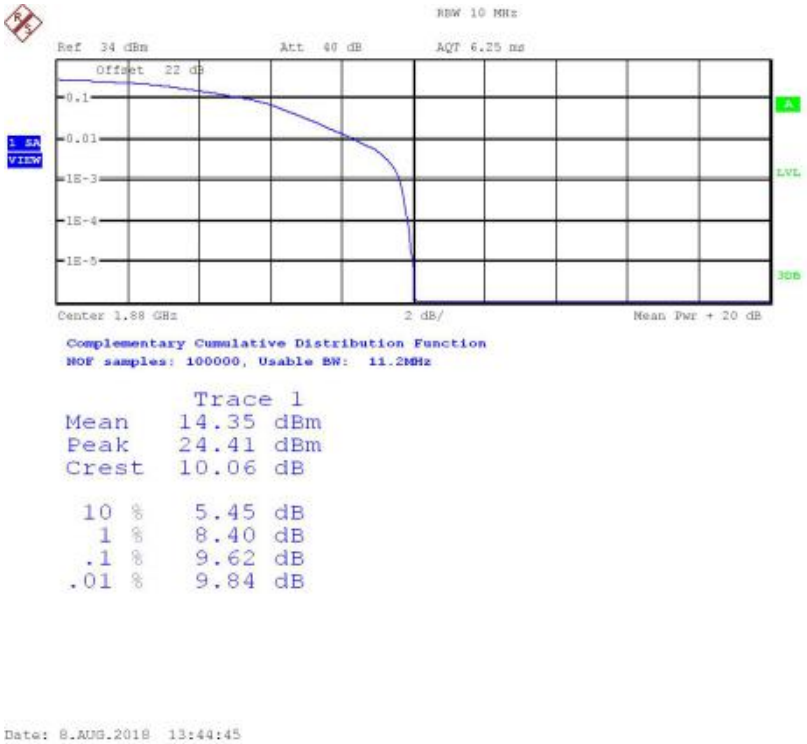
	Trace 1
Mean	13.58 dBm
Peak	24.82 dBm
Crest	11.24 dB
10 %	5.87 dB
1 %	9.20 dB
.1 %	10.64 dB
.01 %	11.06 dB

Date: 8.AUG.2018 13:45:41

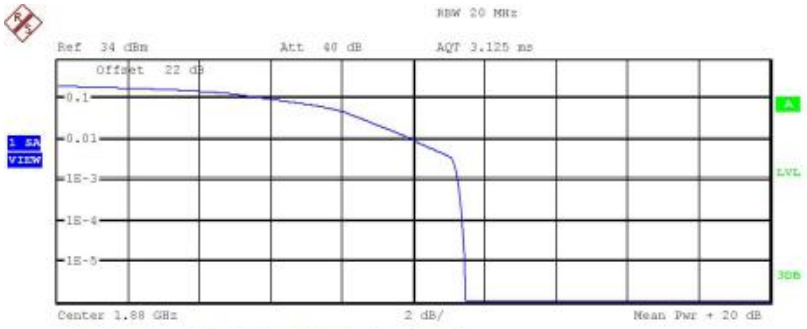
Band2-CH18900-1880MHz-5MHz Bandwidth-16QAM



Band2-CH18900-1880MHz-10MHz Bandwidth-QPSK



Band2-CH18900-1880MHz-10MHz Bandwidth-16QAM

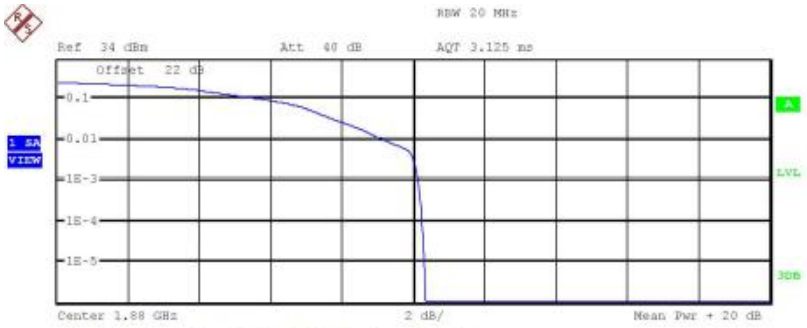


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	14.89 dBm
Peak	26.33 dBm
Crest	11.45 dB
10 %	6.09 dB
1 %	9.97 dB
.1 %	11.25 dB
.01 %	11.38 dB

Date: 8.AUG.2018 13:43:56

Band2-CH18900-1880MHz-15MHz Bandwidth-QPSK

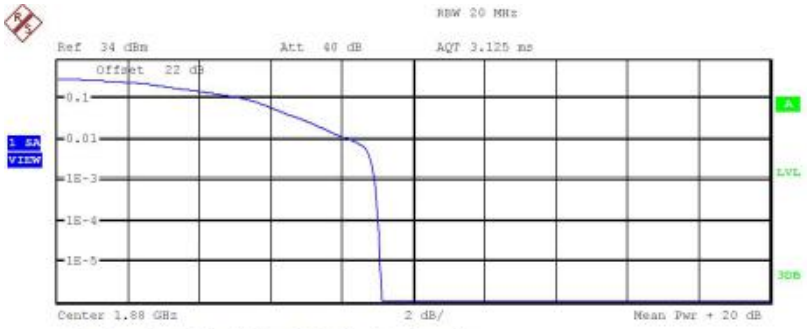


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	15.67 dBm
Peak	25.98 dBm
Crest	10.31 dB
10 %	5.87 dB
1 %	9.20 dB
.1 %	10.13 dB
.01 %	10.26 dB

Date: 8.AUG.2018 13:44:13

Band2-CH18900-1880MHz-15MHz Bandwidth-16QAM

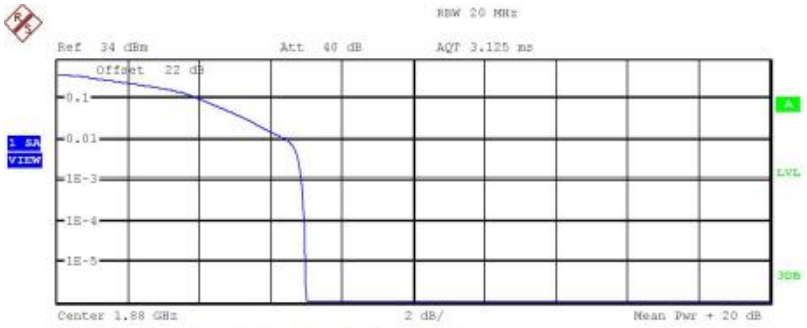


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	17.22 dBm
Peak	26.33 dBm
Crest	9.11 dB
10 %	5.35 dB
1 %	8.24 dB
.1 %	8.91 dB
.01 %	9.01 dB

Date: 8.AUG.2018 13:43:09

Band2-CH18900-1880MHz-20MHz Bandwidth-QPSK

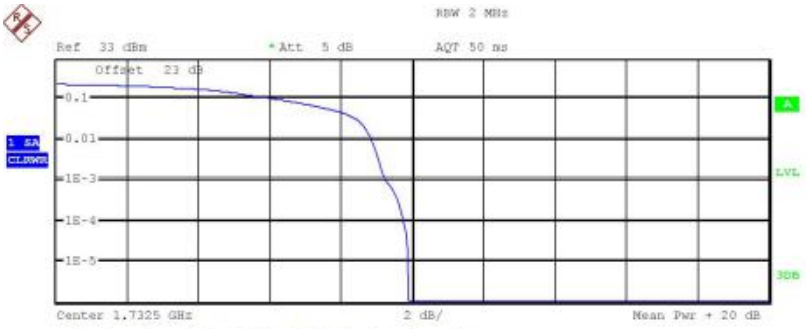


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	18.44 dBm
Peak	25.42 dBm
Crest	6.98 dB
10 %	4.04 dB
1 %	6.44 dB
.1 %	6.86 dB
.01 %	6.96 dB

Date: 8.AUG.2018 13:41:28

Band2-CH18900-1880MHz-20MHz Bandwidth-16QAM



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 1.7MHz

	Trace 1
Mean	14.79 dBm
Peak	24.68 dBm
Crest	9.89 dB
10 %	6.25 dB
1 %	8.88 dB
.1 %	9.26 dB
.01 %	9.74 dB

Date: 7.AUG.2018 11:09:30

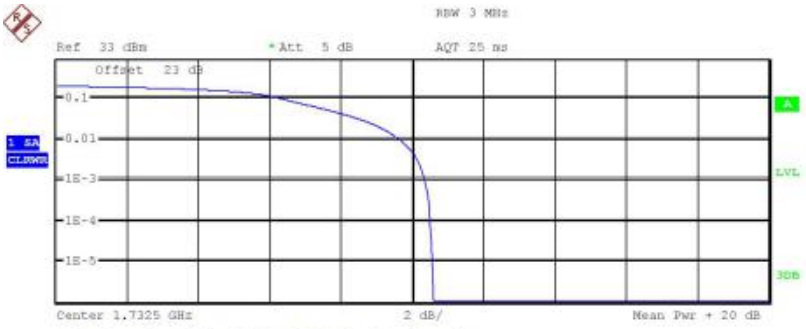
Band4-CH20175-707.5MHz -1.4MHz Bandwidth-QPSK

Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 1.7MHz

	Trace 1
Mean	13.69 dBm
Peak	25.10 dBm
Crest	11.41 dB
10 %	6.54 dB
1 %	10.06 dB
.1 %	10.99 dB
.01 %	11.28 dB

Date: 7.AUG.2018 11:09:51

Band4-CH20175-707.5MHz -1.4MHz Bandwidth-16QAM

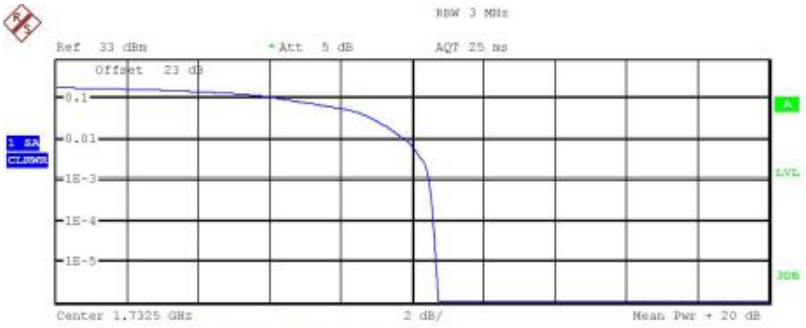


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 3.5MHz

	Trace 1
Mean	13.90 dBm
Peak	24.47 dBm
Crest	10.57 dB
10 %	6.44 dB
1 %	9.68 dB
.1 %	10.35 dB
.01 %	10.51 dB

Date: 7.AUG.2018 11:10:39

Band4-CH20175-707.5MHz -3MHz Bandwidth-QPSK

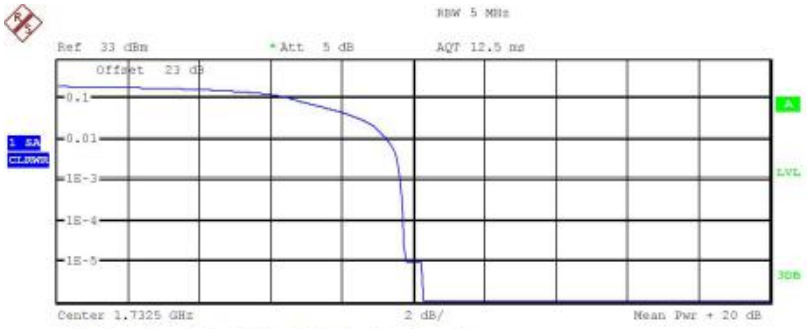


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 3.5MHz

	Trace 1
Mean	14.18 dBm
Peak	24.89 dBm
Crest	10.72 dB
10 %	6.47 dB
1 %	9.81 dB
.1 %	10.48 dB
.01 %	10.61 dB

Date: 7.AUG.2018 11:10:18

Band4-CH20175-707.5MHz -3MHz Bandwidth-16QAM

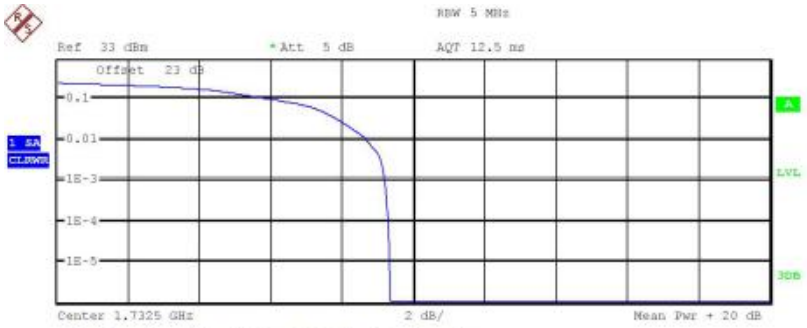


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 7.1MHz

	Trace 1
Mean	14.90 dBm
Peak	25.17 dBm
Crest	10.28 dB
10 %	6.63 dB
1 %	9.26 dB
.1 %	9.65 dB
.01 %	9.71 dB

Date: 7.AUG.2018 11:11:13

Band4-CH20175-707.5MHz -5MHz Bandwidth-QPSK

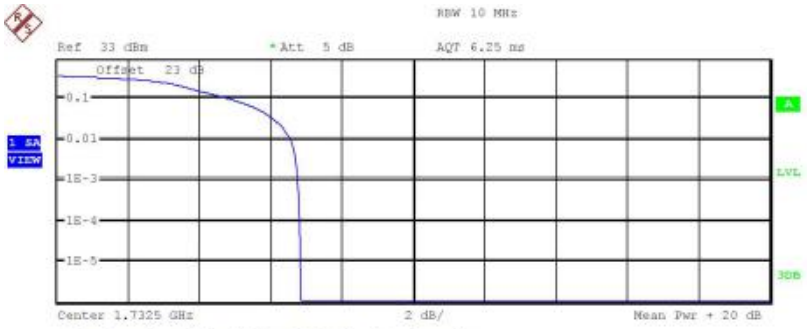


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 7.1MHz

	Trace 1
Mean	15.22 dBm
Peak	24.54 dBm
Crest	9.32 dB
10 %	6.09 dB
1 %	8.69 dB
.1 %	9.20 dB
.01 %	9.29 dB

Date: 7.AUG.2018 11:11:32

Band4-CH20175-707.5MHz-5MHz Bandwidth-16QAM

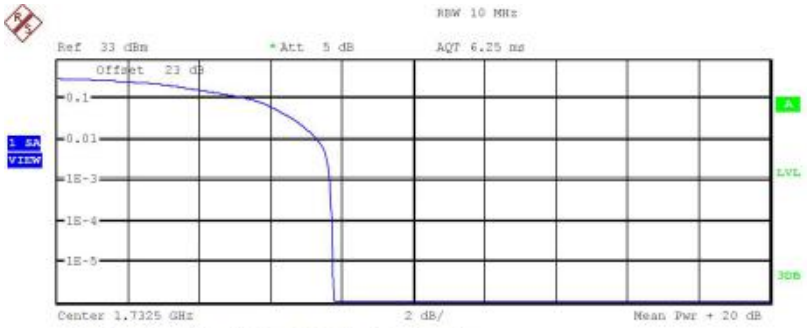


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	17.66 dBm
Peak	24.48 dBm
Crest	6.82 dB
10 %	4.90 dB
1 %	6.57 dB
.1 %	6.76 dB
.01 %	6.83 dB

Date: 7.AUG.2018 11:12:33

Band4-CH20175-707.5MHz-10MHz Bandwidth-QPSK

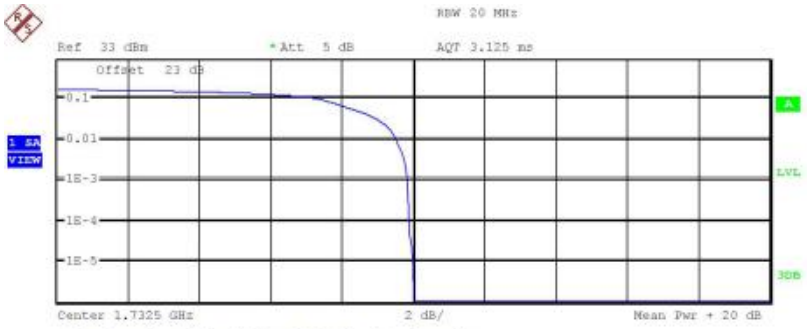


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	16.74 dBm
Peak	24.48 dBm
Crest	7.75 dB
10 %	5.48 dB
1 %	7.31 dB
.1 %	7.66 dB
.01 %	7.72 dB

Date: 7.AUG.2018 11:12:07

Band4-CH20175-707.5MHz-10MHz Bandwidth-16QAM

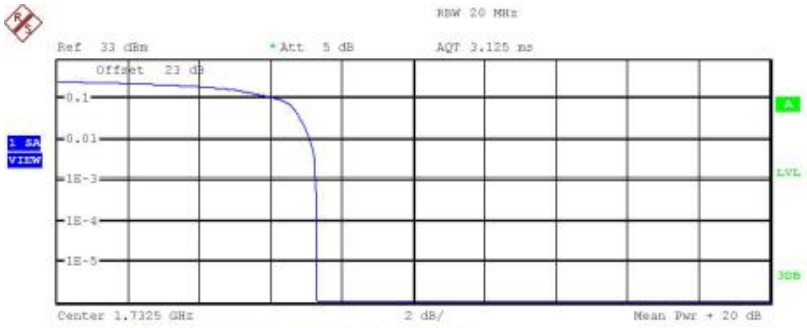


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	14.92 dBm
Peak	24.92 dBm
Crest	10.01 dB
10 %	7.44 dB
1 %	9.52 dB
.1 %	9.84 dB
.01 %	9.90 dB

Date: 7.AUG.2018 11:13:10

Band4-CH20175-707.5MHz -15MHz Bandwidth-QPSK

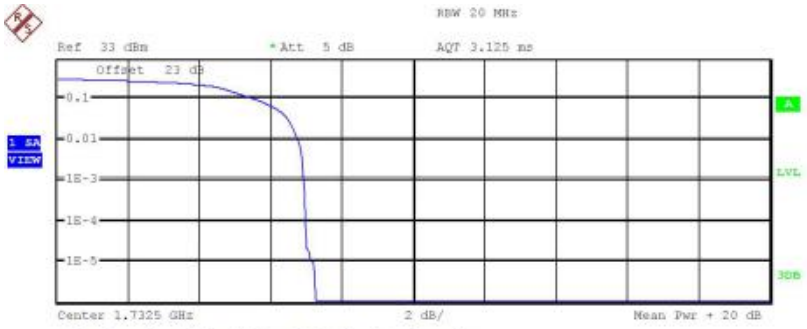


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	17.72 dBm
Peak	24.99 dBm
Crest	7.27 dB
10 %	6.25 dB
1 %	7.12 dB
.1 %	7.28 dB
.01 %	7.31 dB

Date: 7.AUG.2018 11:13:38

Band4-CH20175-707.5MHz-15MHz Bandwidth-16QAM

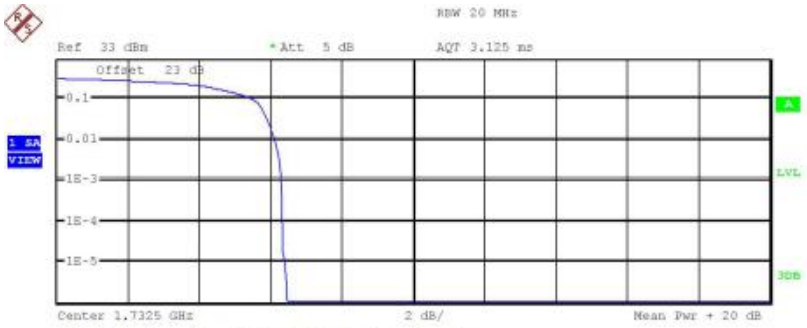


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	17.80 dBm
Peak	25.06 dBm
Crest	7.26 dB
10 %	5.58 dB
1 %	6.76 dB
.1 %	6.92 dB
.01 %	6.99 dB

Date: 7.AUG.2018 11:14:38

Band4-CH20175-707.5MHz-20MHz Bandwidth-QPSK

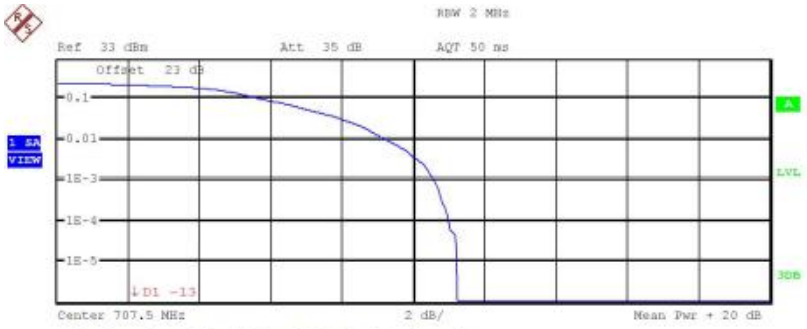


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	18.68 dBm
Peak	25.13 dBm
Crest	6.46 dB
10 %	5.51 dB
1 %	6.12 dB
.1 %	6.31 dB
.01 %	6.35 dB

Date: 7.AUG.2018 11:14:10

Band4-CH20175-707.5MHz-20MHz Bandwidth-16QAM

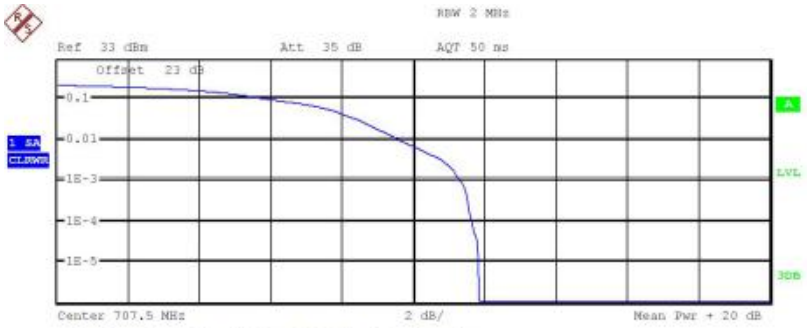


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 1.7MHz

	Trace 1
Mean	15.97 dBm
Peak	27.20 dBm
Crest	11.23 dB
10 %	5.80 dB
1 %	9.23 dB
.1 %	10.58 dB
.01 %	10.99 dB

Date: 7.AUG.2018 15:01:38

Band12-CH23095-782MHz-1.4MHz Bandwidth-QPSK

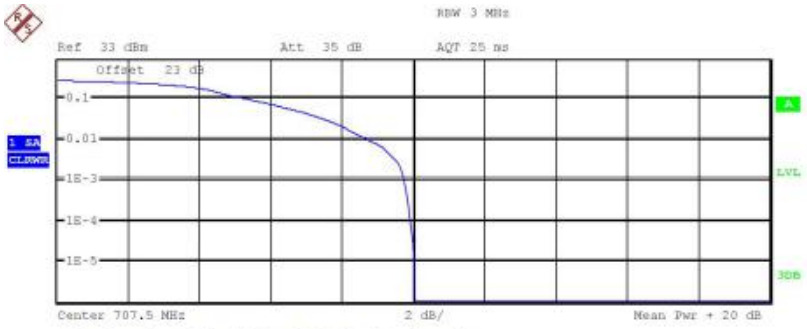


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 1.7MHz

	Trace 1
Mean	16.21 dBm
Peak	28.05 dBm
Crest	11.84 dB
10 %	6.03 dB
1 %	9.62 dB
.1 %	11.31 dB
.01 %	11.63 dB

Date: 7.AUG.2018 15:02:45

Band12-CH23095-782MHz-1.4MHz Bandwidth-16QAM

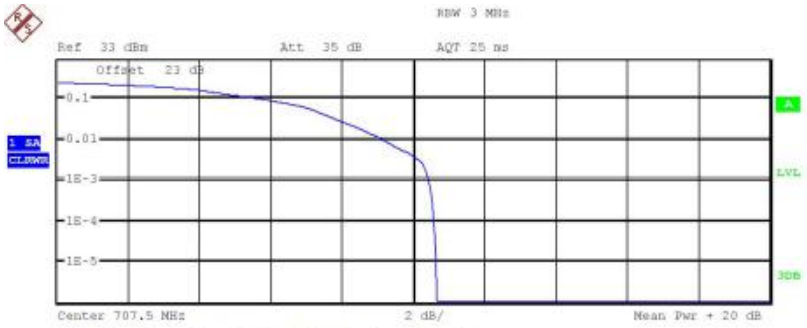


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 3.5MHz

	Trace 1
Mean	17.03 dBm
Peak	27.06 dBm
Crest	10.04 dB
10 %	5.38 dB
1 %	8.75 dB
.1 %	9.74 dB
.01 %	9.94 dB

Date: 7.AUG.2018 15:03:52

Band12-CH23095-782MHz-3MHz Bandwidth-QPSK

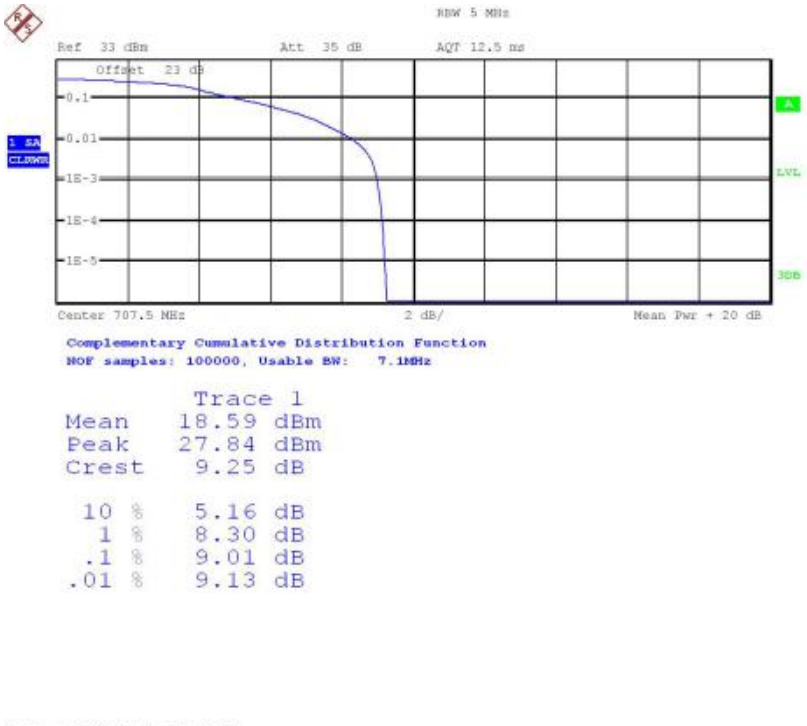


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 3.5MHz

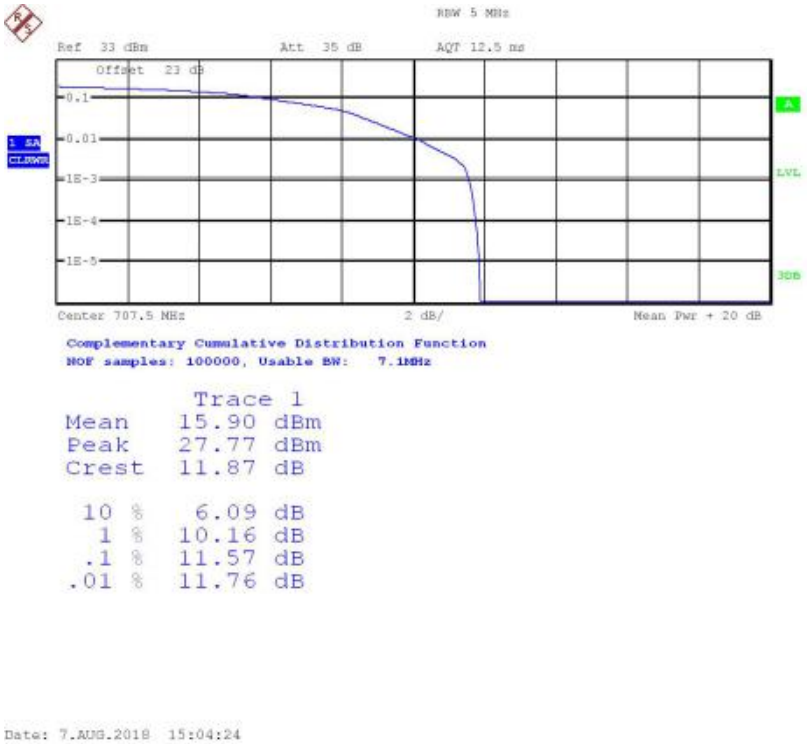
	Trace 1
Mean	17.27 dBm
Peak	27.91 dBm
Crest	10.64 dB
10 %	5.87 dB
1 %	9.17 dB
.1 %	10.42 dB
.01 %	10.58 dB

Date: 7.AUG.2018 15:03:37

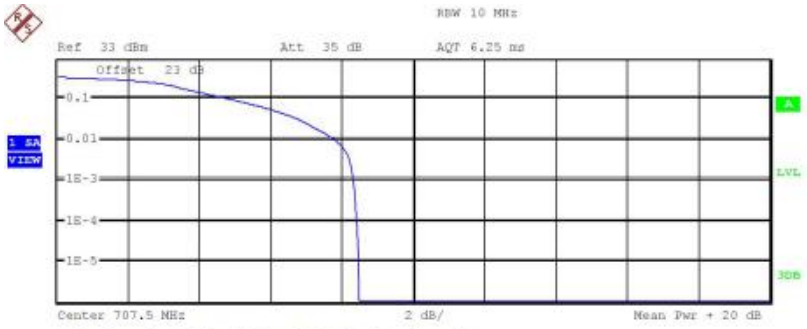
Band12-CH23095-782MHz-3MHz Bandwidth-16QAM



Band12-CH23095-782MHz-5MHz Bandwidth-QPSK



Band12-CH23095-782MHz-5MHz Bandwidth-16QAM

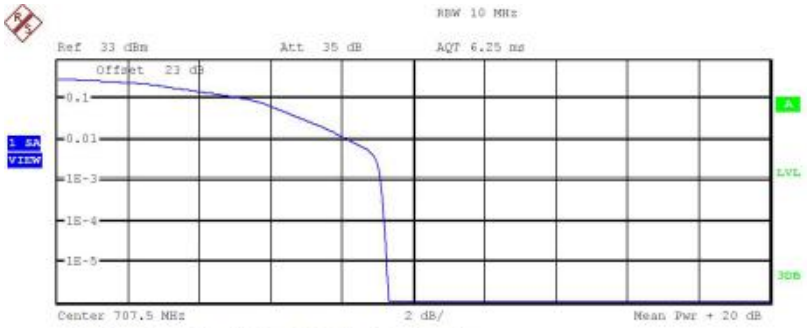


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	19.01 dBm
Peak	27.46 dBm
Crest	8.46 dB
10 %	4.90 dB
1 %	7.79 dB
.1 %	8.33 dB
.01 %	8.43 dB

Date: 7.AUG.2018 15:05:15

Band12-CH23095-782MHz-10MHz Bandwidth-QPSK



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	18.23 dBm
Peak	27.53 dBm
Crest	9.30 dB
10 %	5.38 dB
1 %	8.21 dB
.1 %	9.07 dB
.01 %	9.20 dB

Date: 7.AUG.2018 15:04:59

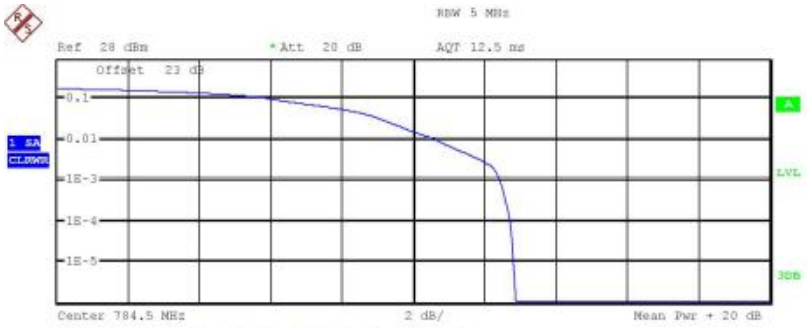
Band12-CH23095-782MHz-10MHz Bandwidth-16QAM

Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 7.1MHz

	Trace 1
Mean	17.08 dBm
Peak	28.27 dBm
Crest	11.19 dB
10 %	6.28 dB
1 %	9.74 dB
.1 %	11.06 dB
.01 %	11.19 dB

Date: 7.AUG.2018 16:20:07

Band13-CH23230-710MHz-5MHz Bandwidth-QPSK

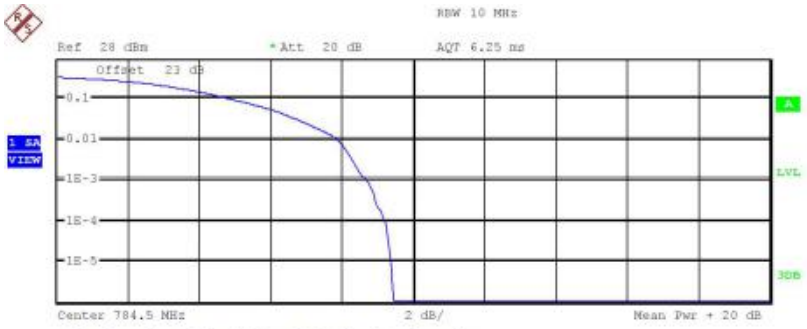


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 7.1MHz

	Trace 1
Mean	15.20 dBm
Peak	28.06 dBm
Crest	12.86 dB
10 %	6.12 dB
1 %	10.64 dB
.1 %	12.44 dB
.01 %	12.72 dB

Date: 7.AUG.2018 16:20:41

Band13-CH23230-710MHz-5MHz Bandwidth-16QAM

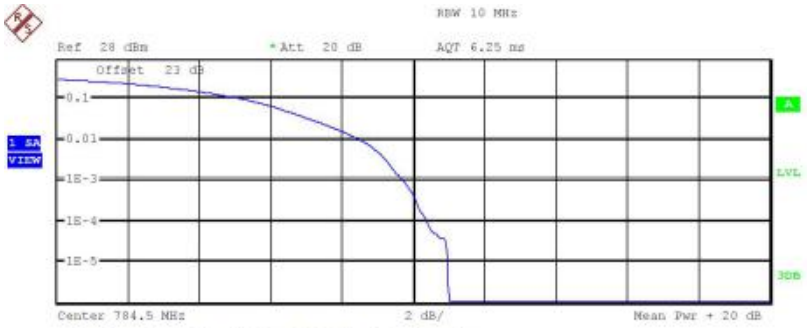


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	12.27 dBm
Peak	21.69 dBm
Crest	9.43 dB
10 %	4.94 dB
1 %	7.85 dB
.1 %	8.69 dB
.01 %	9.20 dB

Date: 7.AUG.2018 16:22:10

Band13-CH23230-710MHz-10MHz Bandwidth-QPSK

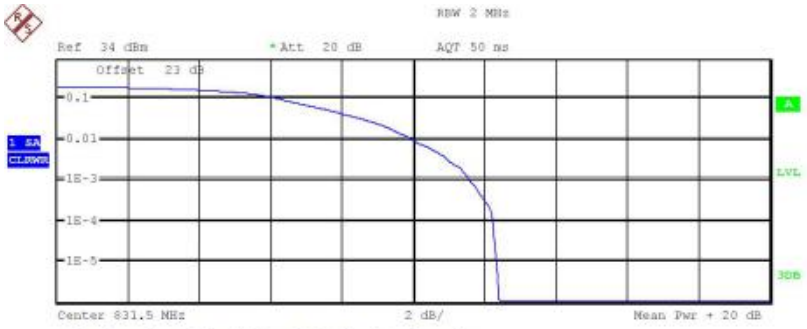


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	11.14 dBm
Peak	22.12 dBm
Crest	10.98 dB
10 %	5.29 dB
1 %	8.49 dB
.1 %	9.71 dB
.01 %	10.38 dB

Date: 7.AUG.2018 16:21:51

Band13-CH23230-710MHz-10MHz Bandwidth-16QAM

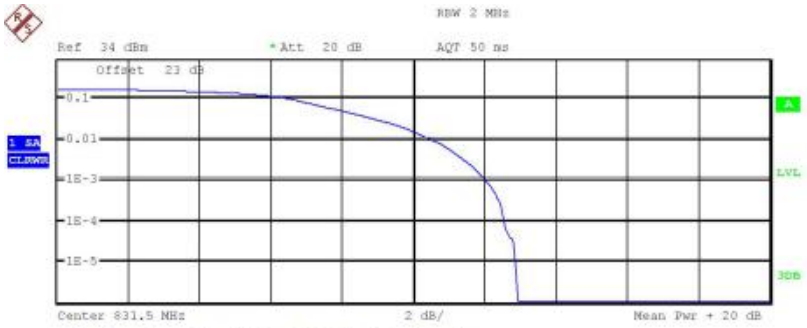


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 1.7MHz

Trace 1	
Mean	14.06 dBm
Peak	26.46 dBm
Crest	12.39 dB
10 %	6.31 dB
1 %	10.00 dB
.1 %	11.57 dB
.01 %	12.24 dB

Date: 7.AUG.2018 18:04:52

Band26-CH26865-831.5MHz-1.4MHz Bandwidth-QPSK

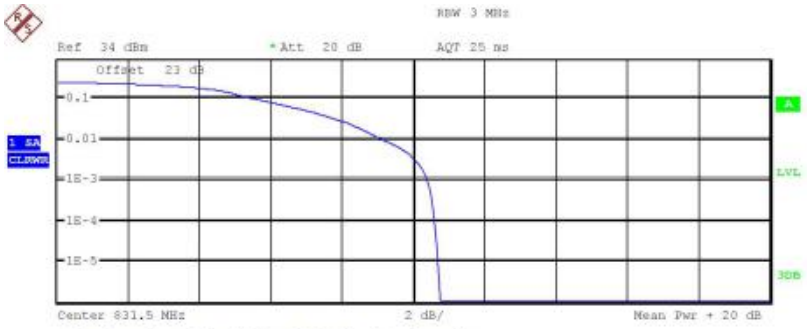


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 1.7MHz

Trace 1	
Mean	13.47 dBm
Peak	26.39 dBm
Crest	12.92 dB
10 %	6.63 dB
1 %	10.54 dB
.1 %	12.02 dB
.01 %	12.56 dB

Date: 7.AUG.2018 18:04:45

Band26-CH26865-831.5MHz-1.4MHz Bandwidth-16QAM

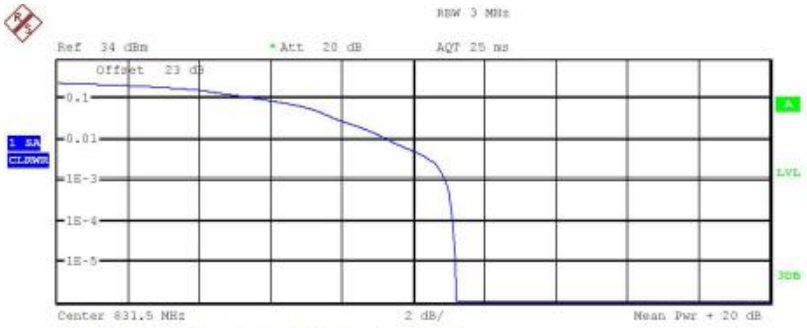


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 3.5MHz

	Trace 1
Mean	15.64 dBm
Peak	26.39 dBm
Crest	10.74 dB
10 %	5.64 dB
1 %	9.13 dB
.1 %	10.38 dB
.01 %	10.61 dB

Date: 7.AUG.2018 18:06:15

Band26-CH26865-831.5MHz-3MHz Bandwidth-QPSK

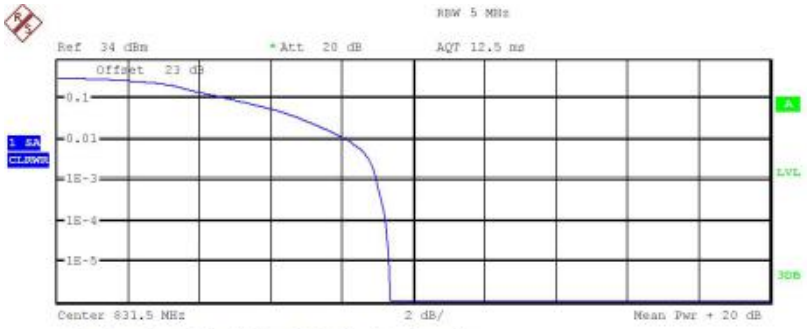


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 3.5MHz

	Trace 1
Mean	16.25 dBm
Peak	27.44 dBm
Crest	11.19 dB
10 %	5.83 dB
1 %	9.29 dB
.1 %	10.90 dB
.01 %	11.12 dB

Date: 7.AUG.2018 18:07:29

Band26-CH26865-831.5MHz-3MHz Bandwidth-16QAM

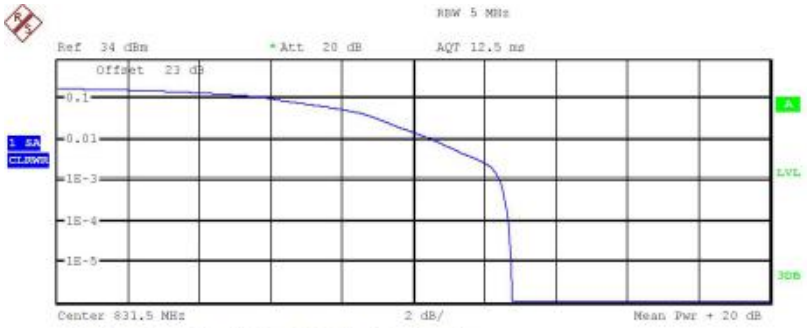


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 7.1MHz

	Trace 1
Mean	18.04 dBm
Peak	27.37 dBm
Crest	9.33 dB
10 %	4.90 dB
1 %	8.17 dB
.1 %	8.97 dB
.01 %	9.23 dB

Date: 7.AUG.2018 18:09:03

Band26-CH26865-831.5MHz-5MHz Bandwidth-QPSK

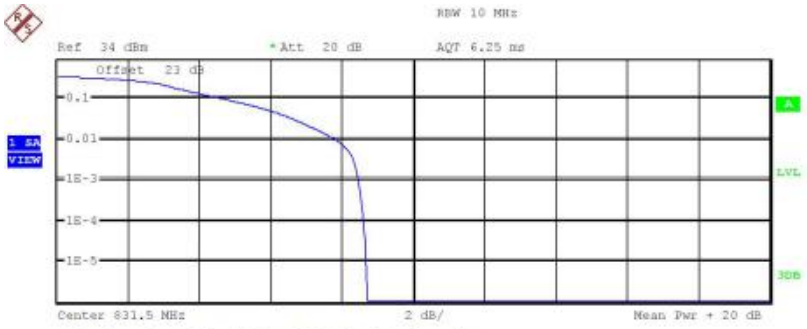


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 7.1MHz

	Trace 1
Mean	14.54 dBm
Peak	27.30 dBm
Crest	12.77 dB
10 %	6.19 dB
1 %	10.58 dB
.1 %	12.44 dB
.01 %	12.66 dB

Date: 7.AUG.2018 18:08:47

Band26-CH26865-831.5MHz-5MHz Bandwidth-16QAM

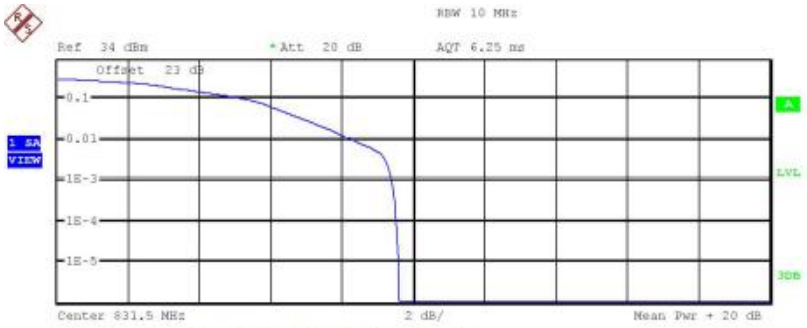


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	18.52 dBm
Peak	27.21 dBm
Crest	8.68 dB
10 %	4.78 dB
1 %	7.82 dB
.1 %	8.46 dB
.01 %	8.62 dB

Date: 7.AUG.2018 18:09:36

Band26-CH26865-831.5MHz-10MHz Bandwidth-QPSK

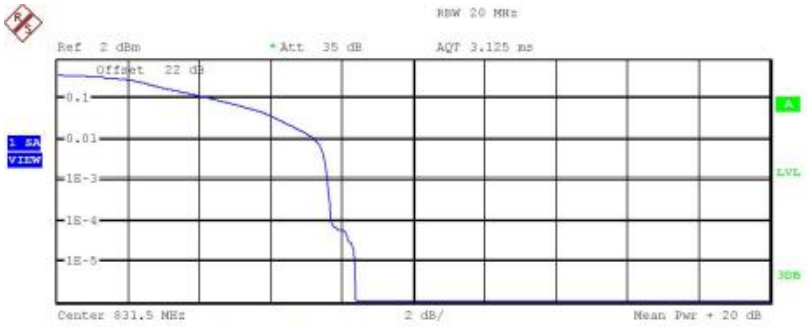


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	17.55 dBm
Peak	27.14 dBm
Crest	9.58 dB
10 %	5.35 dB
1 %	8.30 dB
.1 %	9.39 dB
.01 %	9.52 dB

Date: 7.AUG.2018 18:10:00

Band26-CH26865-831.5MHz-10MHz Bandwidth-16QAM

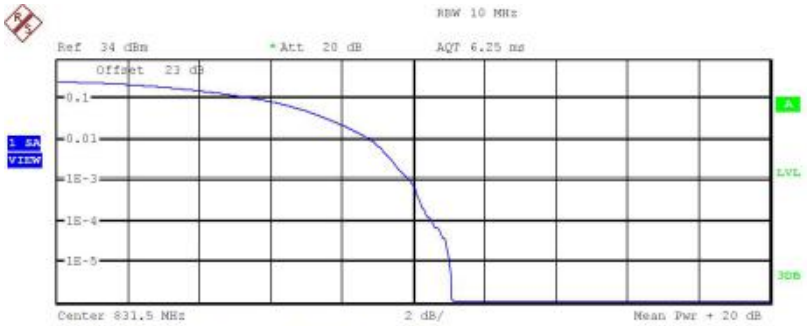


Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 23.7MHz

	Trace 1
Mean	19.13 dBm
Peak	27.52 dBm
Crest	8.39 dB
10 %	4.42 dB
1 %	7.24 dB
.1 %	7.60 dB
.01 %	7.69 dB

Date: 8.AUG.2018 09:58:11

Band26-CH26865-831.5MHz-15MHz Bandwidth-QPSK



Complementary Cumulative Distribution Function
NOF samples: 100000, Usable BW: 11.2MHz

	Trace 1
Mean	13.16 dBm
Peak	24.24 dBm
Crest	11.08 dB
10 %	5.71 dB
1 %	8.81 dB
.1 %	9.90 dB
.01 %	10.54 dB

Date: 7.AUG.2018 18:10:39

5.9 ERP and EIRP

Specifications:	FCC Part 22.913(a), 24.232(b)
DUT Serial Number:	S2:MP0618221C7CAF8
Test conditions:	Ambient Temperature:15℃-35℃ Relative Humidity:30%-60% Air pressure: 86-106kPa
Test Results:	--

Limit

Part 22:

According to Part 22.913(a)(2):The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

Part 24:

According to Part 24.232(b)):The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

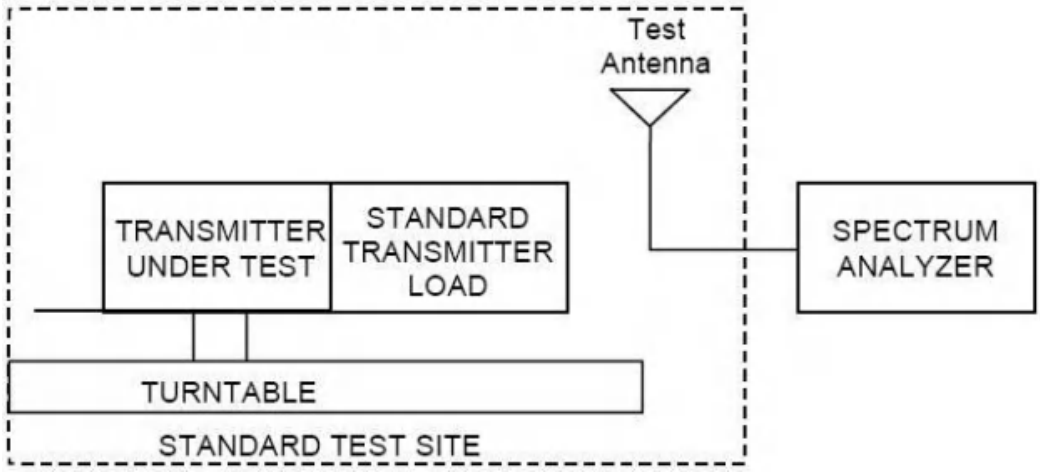
Test Setup

The EUT was placed in an anechoic chamber. The Communications Test Set was used to set the TX channel and power level and modulate the TX signal with different bit patterns.

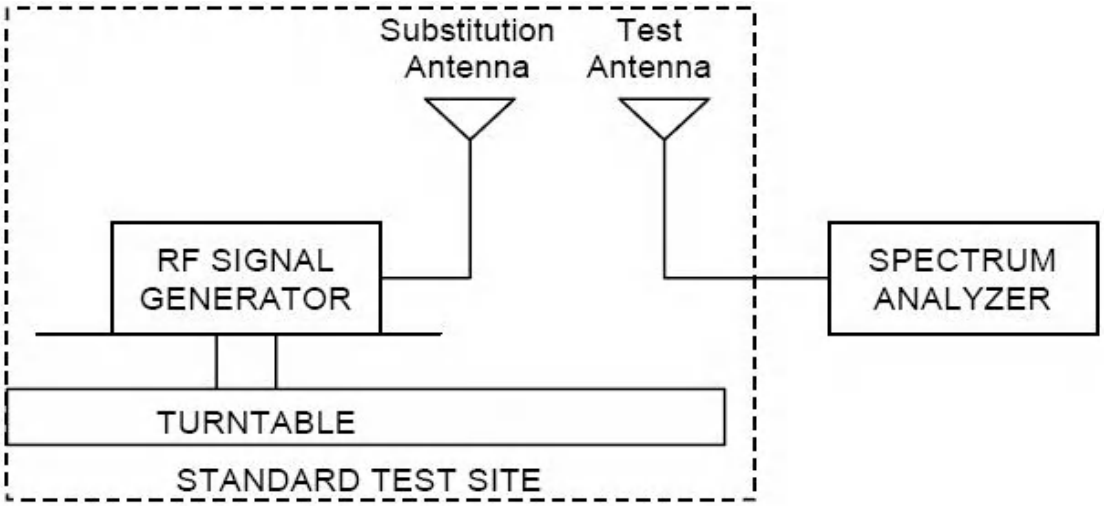
Test Method:

The measurement method is substitution method accordance with section 2.2.12 of ANSI/TIA-603-C: Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.

(a) Connect the equipment as illustrated and measure the spurious emissions as the method as above.



(b) Reconnect the equipment as illustrated.



(c) Remove the transmitter and replace it with a substitution antenna. The center of the substitution antenna should be approximately at the same location as the center of the transmitter.

(d) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized, and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

(e) Repeat step d) with both antennas vertically polarized for each spurious frequency.

(f) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps d) and e) by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula:

ERP=S.G output(dBM)-cable loss (dB) + antenna gain (dBd)

EIRP=S.G output(dBM)-cable loss (dB) + antenna gain (dBi)

5.9.1 GSM 850 ERP Results

Test Data （GMSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
824.2	27.20	3.4	-0.96	31.56	V
836.6	27.38	3.4	-0.96	31.74	V
848.8	27.07	3.4	-0.96	31.43	V

Test Data （8PSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
824.2	27.10	3.4	-0.96	30.46	V
836.6	27.72	3.4	-0.96	31.08	V
848.8	27.23	3.4	-0.96	30.59	V

5.9.2 GSM 1900 EIRP

Test Data （GMSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1850.2	32.27	5.0	10.4	26.87	V
1880.0	32.44	5.0	10.4	27.04	V
1909.8	32.55	5.1	10.4	27.25	V

Test Data （8PSK Mode ）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1850.2	32.36	5.0	10.4	26.96	V
1880.0	32.23	5.0	10.4	26.83	V
1909.8	32.48	5.1	10.4	27.18	V

5.9.3 NB-IoT Band 2 EIRP

Test Data （QPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1850.0	27.63	5.0	10.4	22.23	V
1880.0	27.58	5.0	10.4	22.18	V
1910.0	27.79	5.1	10.4	22.49	V

Test Data （BPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1850.0	27.34	5.0	10.4	21.94	V
1880.0	27.72	5.0	10.4	22.32	V
1910.0	27.48	5.1	10.4	22.18	V

5.9.4 NB-IoT Band 12 ERP

Test Data （QPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
699.0	17.63	3.1	-1.1	21.83	V
707.5	17.85	3.1	-1.1	22.05	V
715.3	17.75	3.1	-1.1	21.95	V
715.9	-19.95	3.1	-1.1	-15.75	V

Test Data （BPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
699.0	17.68	3.1	-1.1	21.88	V
707.5	17.74	3.1	-1.1	21.94	V

715.3	17.83	3.1	-1.1	22.03	V
715.9	-19.50	3.1	-1.1	-15.30	V

5.9.5 NB-IoT Band 13 EPR

Test Data （QPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
777.0	18.03	3.3	-0.72	22.05	V
782.0	18.15	3.3	-0.72	22.17	V
787.0	17.92	3.3	-0.72	21.94	V

Test Data （BPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
777.0	17.85	3.3	-0.72	21.87	V
782.0	18.08	3.3	-0.72	22.10	V
787.0	18.27	3.3	-0.72	22.29	V

5.9.6 NB-IoT Band 17 ERP

Test Data （QPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
704.0	17.83	3.1	-1.11	22.04	V
710.0	17.54	3.1	-1.11	21.75	V
716.0	17.47	3.1	-1.11	21.68	V

Test Data （BPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
704.0	18.15	3.1	-1.11	22.36	V

710.0	17.97	3.1	-1.11	22.18	V
716.0	17.78	3.1	-1.11	21.99	V

5.9.7 NB-IoT Band 26 ERP

Test Data （QPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
814.0	17.82	3.3	-0.72	21.84	V
831.5	17.75	3.4	-0.96	22.11	V
849.0	17.10	3.4	-0.96	21.46	V

Test Data （BPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
814.0	17.53	3.3	-0.72	21.55	V
831.5	17.42	3.4	-0.96	21.78	V
849.0	17.13	3.4	-0.96	21.49	V

5.9.8 Cat-M Band 2 EIRP

Test Data （QPSK Mode ）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1850.0	27.04	5.0	10.4	21.64	V
1880.0	27.41	5.0	10.4	22.01	V
1910.0	26.26	5.1	10.4	20.96	V

Test Data （16QAM Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1850.0	26.83	5.0	10.4	21.43	V

1880.0	27.16	5.0	10.4	21.76	V
1910.0	26.58	5.1	10.4	21.28	V

5.9.9 Cat-M Band4 EIRP

Test Data （QPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1710.0	26.71	4.8	10.4	21.11	V
1732.5	26.87	4.9	10.4	21.37	V
1755.0	26.44	4.9	10.4	20.94	V

Test Data （16QAM Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
1710.0	26.93	4.8	10.4	21.33	V
1732.5	27.15	4.9	10.4	21.65	V
1755.0	26.25	4.9	10.4	20.75	V

5.9.10 Cat-M Band 12 ERP

Test Data （QPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
699.0	17.18	3.1	-1.1	21.38	V
707.5	17.42	3.1	-1.1	21.62	V
716.0	17.11	3.1	-1.1	21.31	V

Test Data （16QAM Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
699.0	17.23	3.1	-1.1	21.43	V

707.5	17.85	3.1	-1.1	22.05	V
716.0	17.01	3.1	-1.1	21.21	V

5.9.11 Cat-M Band 13 ERP

Test Data （QPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
777.0	17.13	3.3	-0.72	21.15	V
782.0	17.40	3.3	-0.72	21.42	V
787.0	17.21	3.3	-0.72	21.23	V

Test Data （16QAM Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
777.0	17.33	3.3	-0.72	21.35	V
782.0	17.64	3.3	-0.72	21.66	V
787.0	18.01	3.3	-0.72	22.03	V

5.9.12 Cat-M Band 26 ERP

Test Data （QPSK Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
814.0	17.07	3.3	-0.72	21.09	V
831.5	17.08	3.4	-0.96	21.44	V
849.0	17.38	3.4	-0.96	21.74	V

Test Data （16QAM Mode）

Frequency [MHz]	Generator output power(P_g) [dBm]	Cable loss [dB]	Antenna Gain [dB]	Spurious Emission Power (P_d) [dBm]	Antenna Polarization [H/V]
814.0	17.99	3.3	-0.72	22.01	V

831.5	17.27	3.4	-0.96	21.63	V
849.0	17.03	3.4	-0.96	21.39	V

Annex A EUT Photos

See the document"SIM7000G-External Photos".
See the document"SIM7000G-Internal Photos".

ANNEX B Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

End Of Report