

Product	Module		
Test Item	Peak To Average Ratio		
Test Mode	Mode 5 : LTE Cat-M1_Band 13		
Date of Test	2020/02/10	Test Site	SR12-H
Temperature (°C)	18.0	Humidity (%RH)	55.0

Band width (MHz)	Channel	Freq. (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
5M	23205	779.5	QPSK	29.32	22.97	6.00
			16-QAM	30.19	22.93	7.02
	23230	782	QPSK	29.36	23.12	5.91
			16-QAM	30.14	22.87	7.04
	23255	784.5	QPSK	29.87	23.15	6.35
			16-QAM	30.58	23.33	7.09
10M	23230	782_1RB Low	QPSK	29.05	22.68	6.00
			16-QAM	29.81	22.55	7.04
	23230	782_1RB High	QPSK	29.14	22.83	6.00
			16-QAM	29.89	22.60	6.98

B13_CH23205_5M_1RB0_QPSK_Ratio



B13_CH23230_5M_1RB0_QPSK_Ratio



B13_CH23255_5M_1RB5_QPSK_Ratio



B13_CH23205_5M_1RB0_16-QAM_Ratio



B13_CH23230_5M_1RB0_16-QAM_Ratio



B13_CH23255_5M_1RB5_16-QAM_Ratio



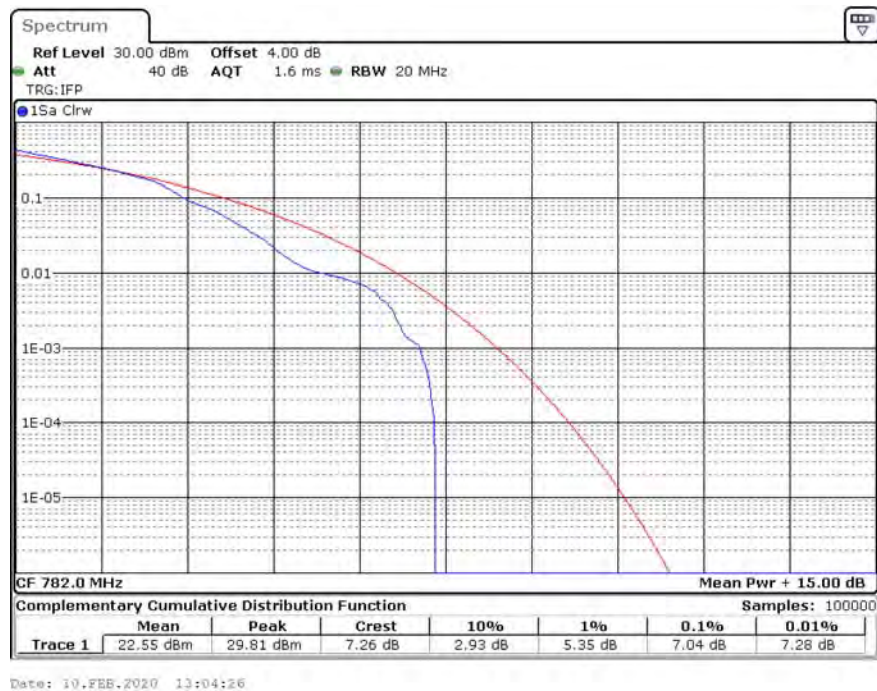
B13_CH23230_10M_QPSK_1RB0_LOW_Ratio



B13_CH23230_10M_QPSK_1RB5_HIGH_Ratio



B13_CH23230_10M_16-QAM_1RB0_LOW_Ratio



B13_CH23230_10M_16-QAM_1RB5_HIGH_Ratio



Product	Module		
Test Item	Peak To Average Ratio		
Test Mode	Mode 6 : LTE Cat-M1_Band 25		
Date of Test	2020/02/11	Test Site	SR12-H
Temperature (°C)	20.0	Humidity (%RH)	56.0

Band width (MHz)	Channel	Freq. (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
1.4M	26047	1850.7	QPSK	28.10	22.99	5.00
			16-QAM	27.55	21.56	5.65
	26365	1882.5	QPSK	28.13	22.91	5.00
			16-QAM	27.14	21.59	5.41
	26683	1914.3	QPSK	28.15	22.79	5.07
			16-QAM	27.09	21.37	5.54
3M	26055	1851.5	QPSK	27.62	22.99	4.52
			16-QAM	28.08	21.76	6.09
	26365	1882.5	QPSK	28.12	22.96	4.96
			16-QAM	27.29	21.74	5.37
	26675	1913.5	QPSK	28.16	22.84	5.04
			16-QAM	28.15	22.84	5.02
5M	26065	1852.5	QPSK	28.12	22.75	5.17
			16-QAM	28.40	22.79	5.52
	26365	1882.5	QPSK	28.16	22.87	5.09
			16-QAM	28.46	22.70	5.61
	26665	1912.5	QPSK	28.24	22.74	5.26
			16-QAM	28.64	22.70	5.76
10M	26090	1855	QPSK	27.57	22.35	5.04
			16-QAM	27.94	22.33	5.48
	26365	1882.5	QPSK	27.90	22.60	5.11
			16-QAM	28.25	22.57	5.54
	26640	1910	QPSK	27.94	22.49	5.24
			16-QAM	28.28	22.49	5.78

Band width (MHz)	Channel	Freq. (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
15M	26115	1857.5	QPSK	26.85	21.63	5.02
			16-QAM	27.25	21.68	5.41
	26365	1882.5	QPSK	27.11	21.83	5.07
			16-QAM	27.42	21.76	5.48
	26615	1907.5	QPSK	27.05	21.58	5.20
			16-QAM	27.45	21.52	5.76
20M	26140	1860	QPSK	26.14	20.77	5.17
			16-QAM	26.43	20.79	5.52
	26365	1882.5	QPSK	26.21	20.91	5.11
			16-QAM	26.50	20.73	5.54
	26590	1905	QPSK	26.26	20.81	5.28
			16-QAM	26.63	21.10	5.41

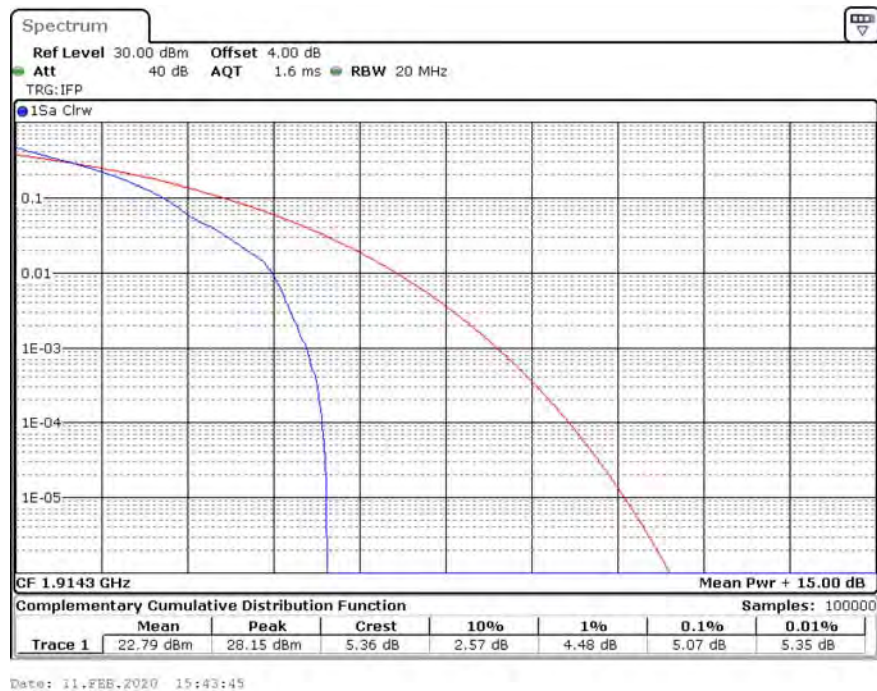
B25_CH26047_1.4M_1RB0_QPSK_Ratio



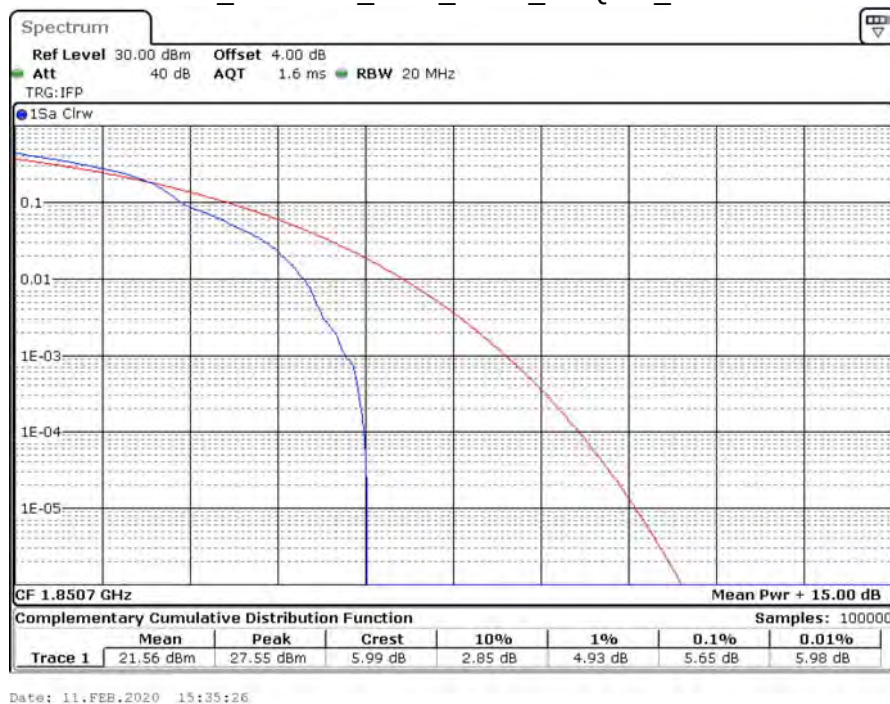
B25_CH26365_1.4M_1RB0_QPSK_Ratio



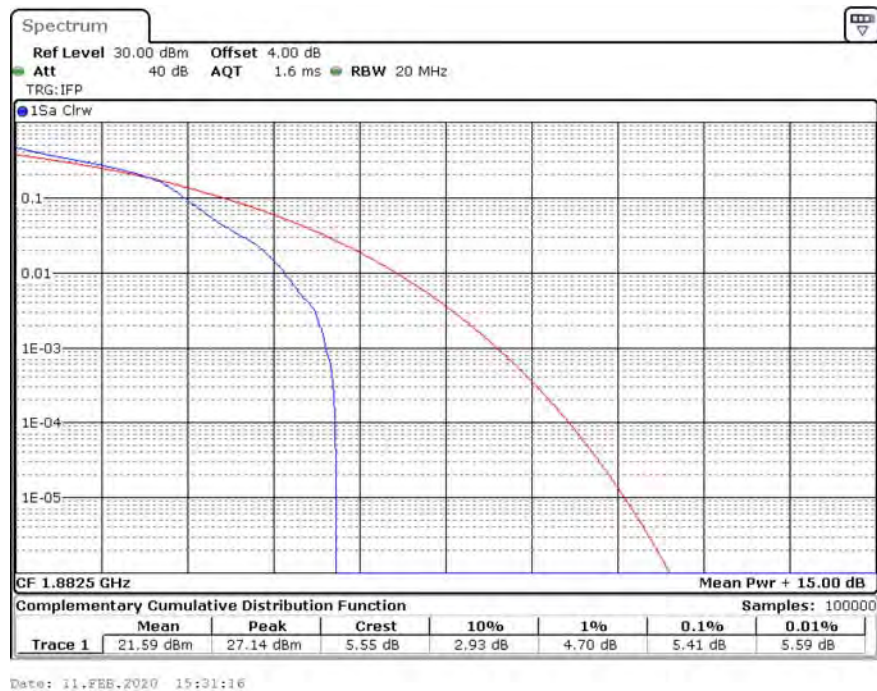
B25_CH26683_1.4M_1RB5_QPSK_Ratio



B25_CH26047_1.4M_1RB0_16-QAM_Ratio



B25_CH26365_1.4M_1RB0_16-QAM_Ratio



B25_CH26683_1.4M_1RB5_16-QAM_Ratio



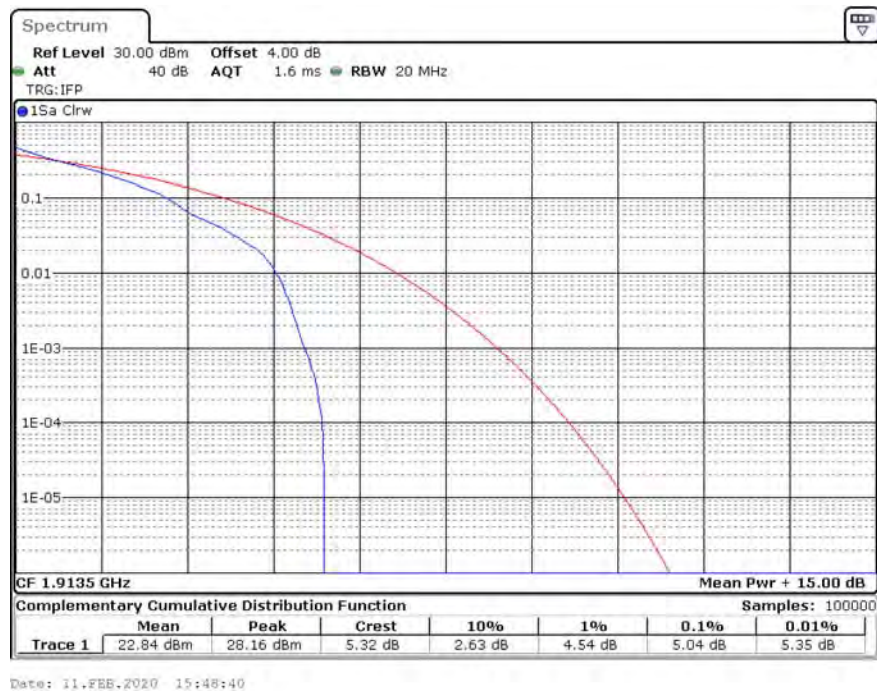
B25_CH26055_3M_1RB0_QPSK_Ratio



B25_CH26365_3M_1RB0_QPSK_Ratio



B25_CH26675_3M_1RB5_QPSK_Ratio



B25_CH26055_3M_1RB0_16-QAM_Ratio



B25_CH26365_3M_1RB0_16-QAM_Ratio



B25_CH26675_3M_1RB5_16-QAM_Ratio



B25_CH26065_5M_1RB0_QPSK_Ratio



B25_CH26365_5M_1RB0_QPSK_Ratio



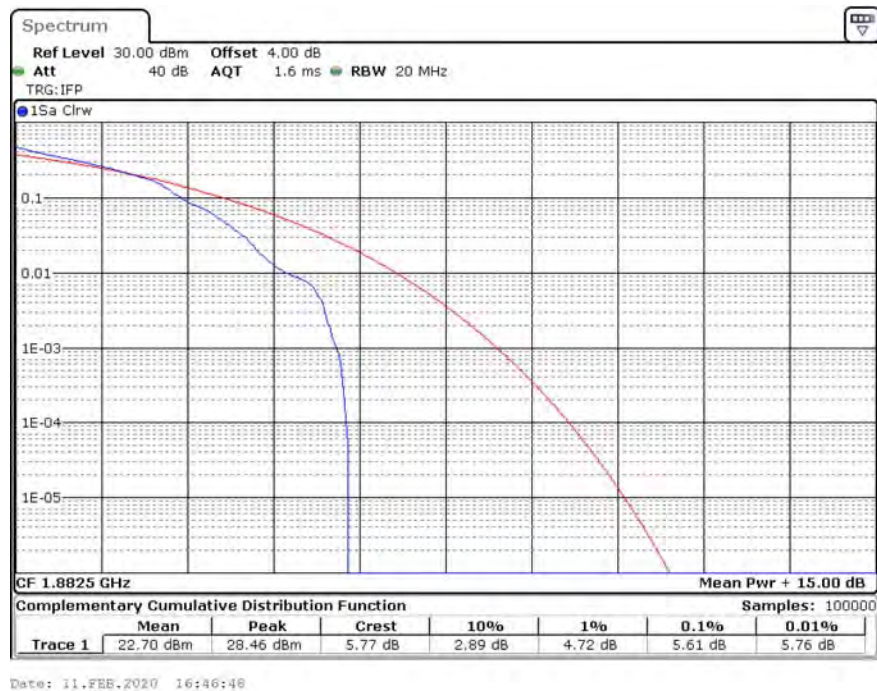
B25_CH26665_5M_1RB5_QPSK_Ratio



B25_CH26065_5M_1RB0_16-QAM_Ratio



B25_CH26365_5M_1RB0_16-QAM_Ratio



B25_CH26665_5M_1RB5_16-QAM_Ratio



B25_CH26090_10M_1RB0_QPSK_Ratio



B25_CH26365_10M_1RB0_QPSK_Ratio



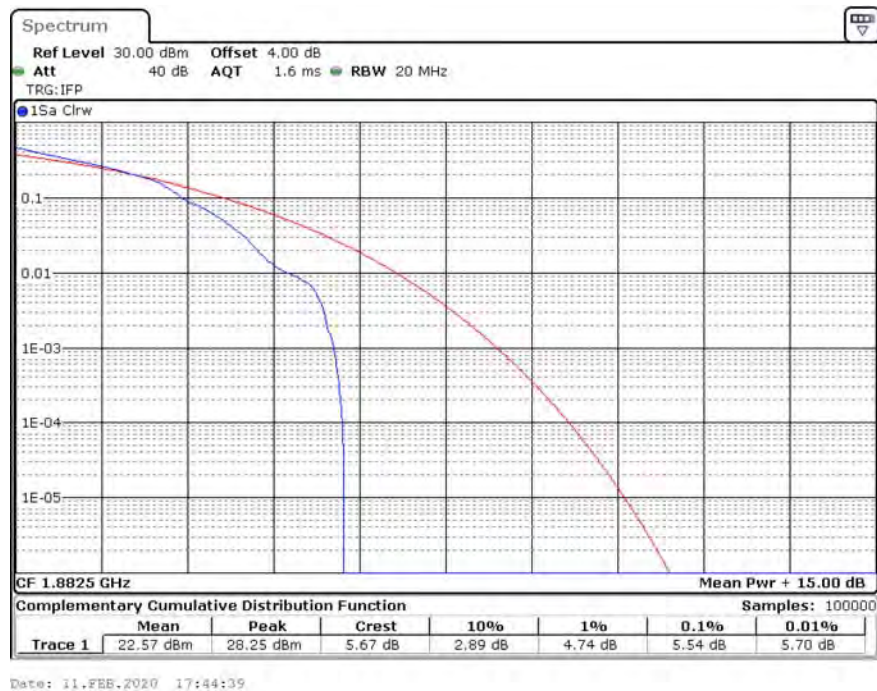
B25_CH26640_10M_1RB5_QPSK_Ratio



B25_CH26090_10M_1RB0_16-QAM_Ratio



B25_CH26365_10M_1RB0_16-QAM_Ratio



B25_CH26640_10M_1RB5_16-QAM_Ratio



B25_CH26115_15M_1RB0_QPSK_Ratio



B25_CH26365_15M_1RB0_QPSK_Ratio



B25_CH26615_15M_1RB5_QPSK_Ratio



B25_CH26115_15M_1RB0_16-QAM_Ratio



B25_CH26365_15M_1RB0_16-QAM_Ratio



B25_CH26615_15M_1RB5_16-QAM_Ratio



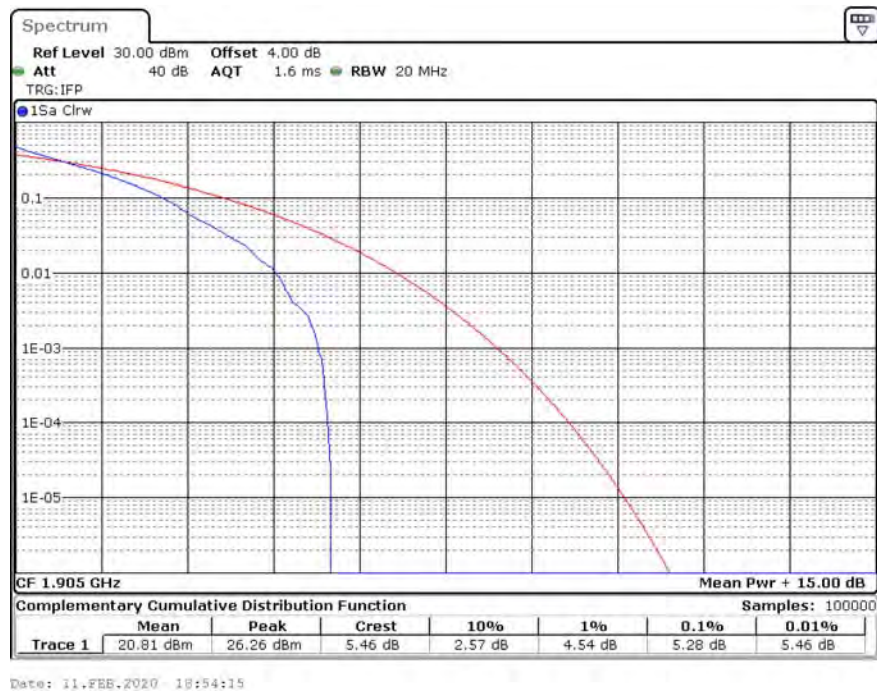
B25_CH26140_20M_1RB0_QPSK_Ratio



B25_CH26365_20M_1RB0_QPSK_Ratio



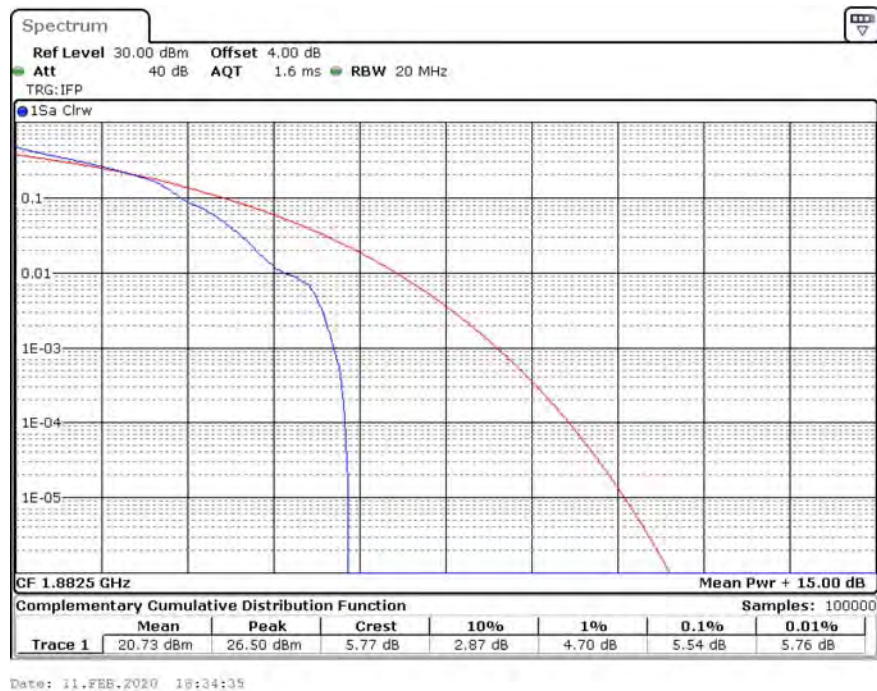
B25_CH26590_20M_1RB5_QPSK_Ratio



B25_CH26140_20M_1RB0_16-QAM_Ratio



B25_CH26365_20M_1RB0_16-QAM_Ratio



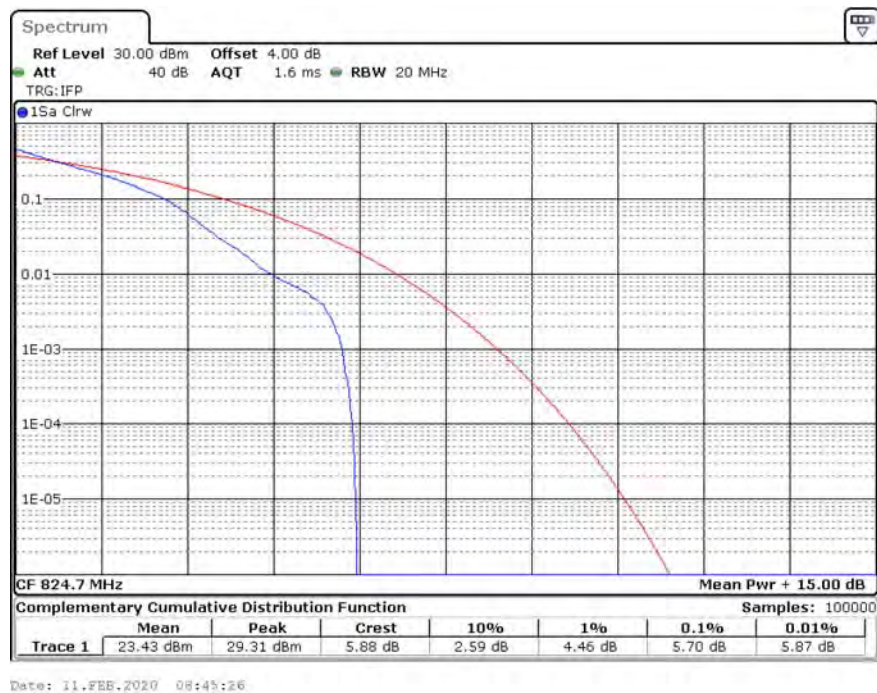
B25_CH26590_20M_1RB5_16-QAM_Ratio



Product	Module		
Test Item	Peak To Average Ratio (Part 22)		
Test Mode	Mode 7 : LTE Cat-M1_Band 26		
Date of Test	2020/02/11	Test Site	SR12-H
Temperature (°C)	20.0	Humidity (%RH)	56.0

Band width (MHz)	Channel	Freq. (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
1.4M	26697	814.7	QPSK	29.31	23.43	5.70
			16-QAM	28.07	22.03	5.78
	26865	831.5	QPSK	29.62	23.51	5.89
			16-QAM	28.59	21.86	6.33
	27033	848.3	QPSK	28.94	23.65	5.11
			16-QAM	29.49	22.61	6.35
3M	26705	815.5	QPSK	29.07	23.20	5.57
			16-QAM	27.83	21.87	5.80
	26865	831.5	QPSK	29.50	23.43	5.85
			16-QAM	28.82	22.23	6.26
	27025	847.5	QPSK	29.31	23.38	5.54
			16-QAM	27.90	21.94	5.80
5M	26715	816.5	QPSK	29.32	23.22	2.80
			16-QAM	29.97	23.00	6.74
	26865	831.5	QPSK	29.24	23.16	5.78
			16-QAM	29.84	22.92	6.72
	27015	846.5	QPSK	29.29	23.12	5.80
			16-QAM	29.79	22.89	6.63
10M	26740	819	QPSK	28.91	22.81	5.89
			16-QAM	29.41	23.18	5.91
	26865	831.5	QPSK	28.92	22.81	5.74
			16-QAM	29.45	22.47	6.76
	26990	844	QPSK	29.18	22.77	6.11
			16-QAM	29.76	22.75	6.83
15M	26765	821.5	QPSK	29.20	23.12	5.76
			16-QAM	29.83	22.87	6.74
	26865	831.5	QPSK	28.00	21.93	5.76
			16-QAM	28.73	21.82	6.70
	26965	841.5	QPSK	28.05	21.90	5.78
			16-QAM	28.62	21.84	6.52

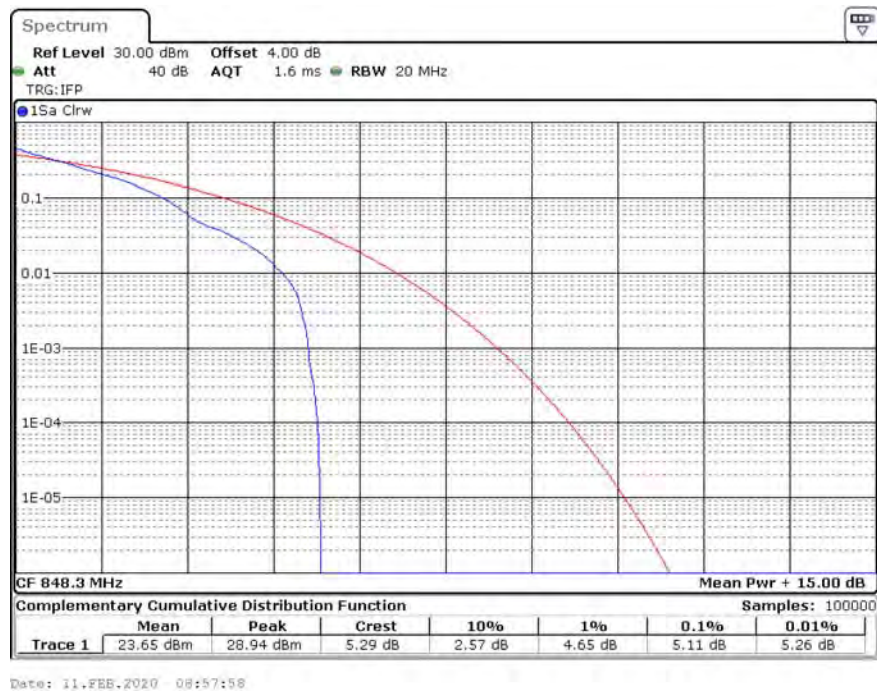
B26_CH26797_1.4M_1RB0_QPSK_Ratio (Part 22)



B26_CH26915_1.4M_1RB0_QPSK_Ratio (Part 22)



B26_CH27033_1.4M_1RB5_QPSK_Ratio (Part 22)



B26_CH26797_1.4M_1RB0_16-QAM_Ratio (Part 22)



B26_CH26915_1.4M_1RB0_16-QAM_Ratio (Part 22)



B26_CH27033_1.4M_1RB5_16-QAM_Ratio (Part 22)



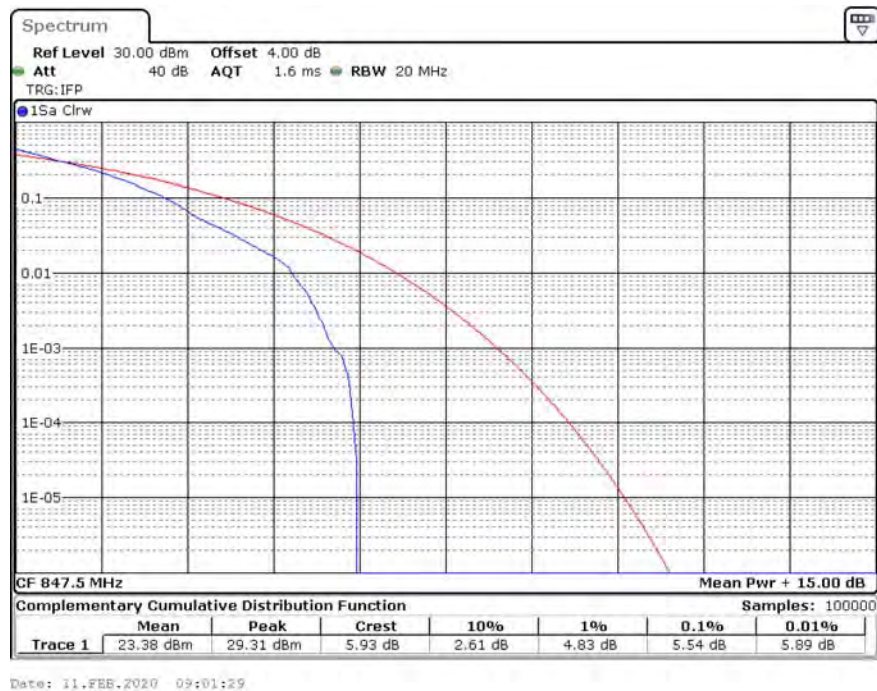
B26_CH26805_3M_1RB0_QPSK_Ratio (Part 22)



B26_CH26915_3M_1RB0_QPSK_Ratio (Part 22)



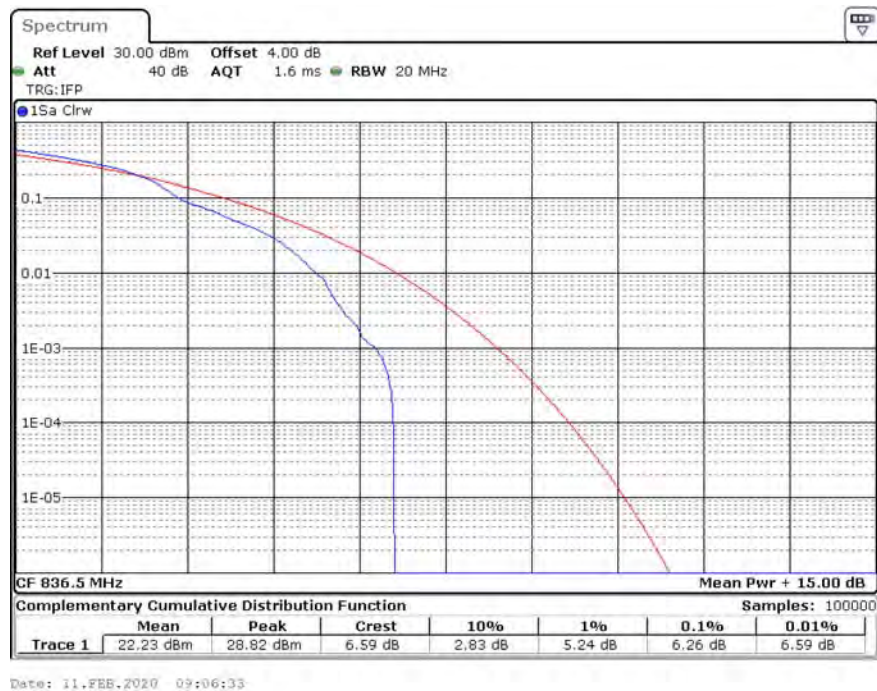
B26_CH27025_3M_1RB5_QPSK_Ratio (Part 22)



B26_CH26805_3M_1RB0_16-QAM_Ratio (Part 22)



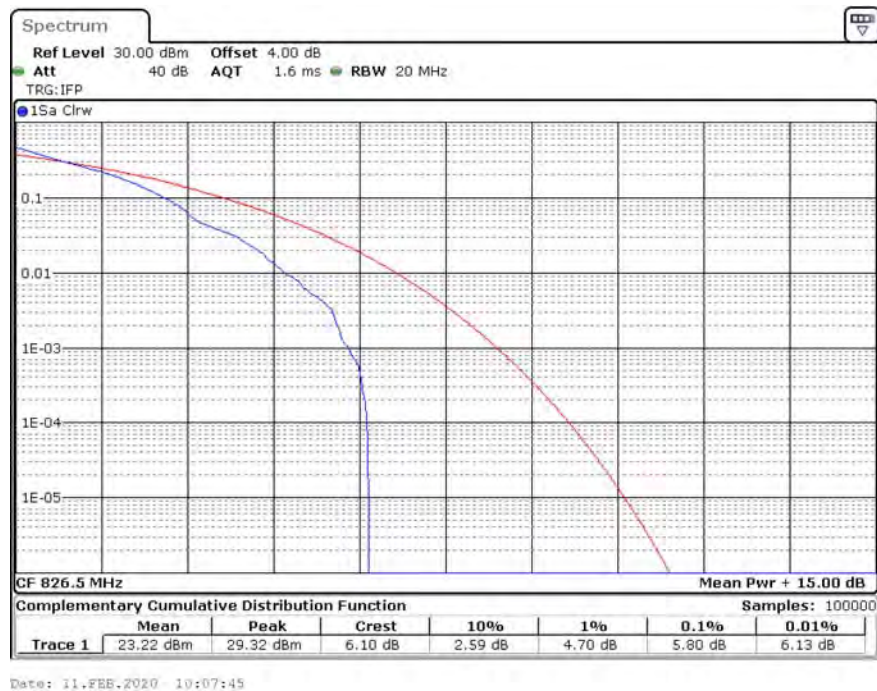
B26_CH26915_3M_1RB0_16-QAM_Ratio (Part 22)



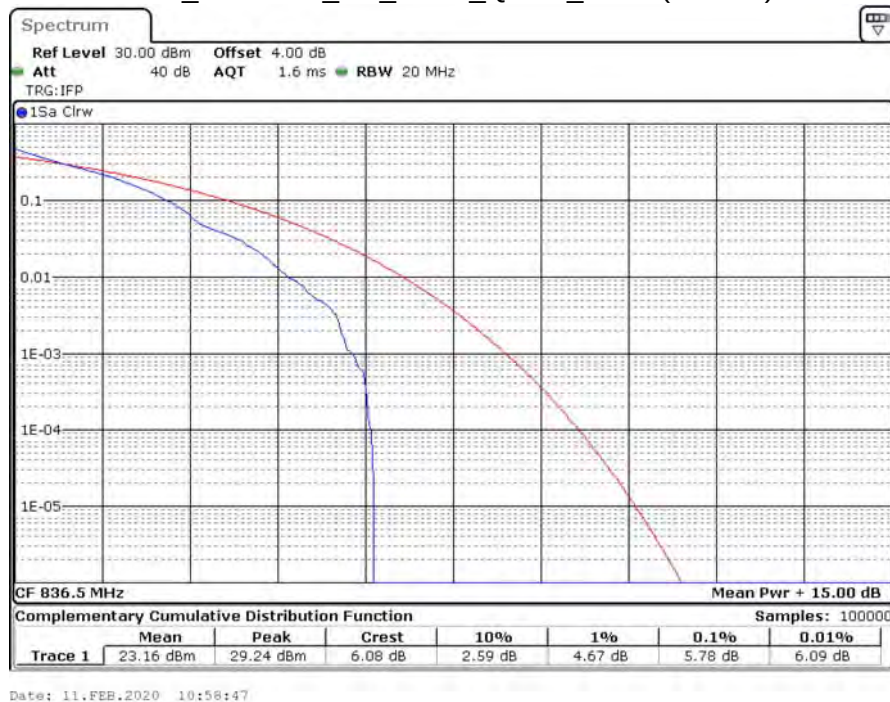
B26_CH27025_3M_1RB5_16-QAM_Ratio (Part 22)



B26_CH26815_5M_1RB0_QPSK_Ratio (Part 22)



B26_CH26915_5M_1RB0_QPSK_Ratio (Part 22)



B26_CH27015_5M_1RB5_QPSK_Ratio (Part 22)



B26_CH26815_5M_1RB0_16-QAM_Ratio (Part 22)



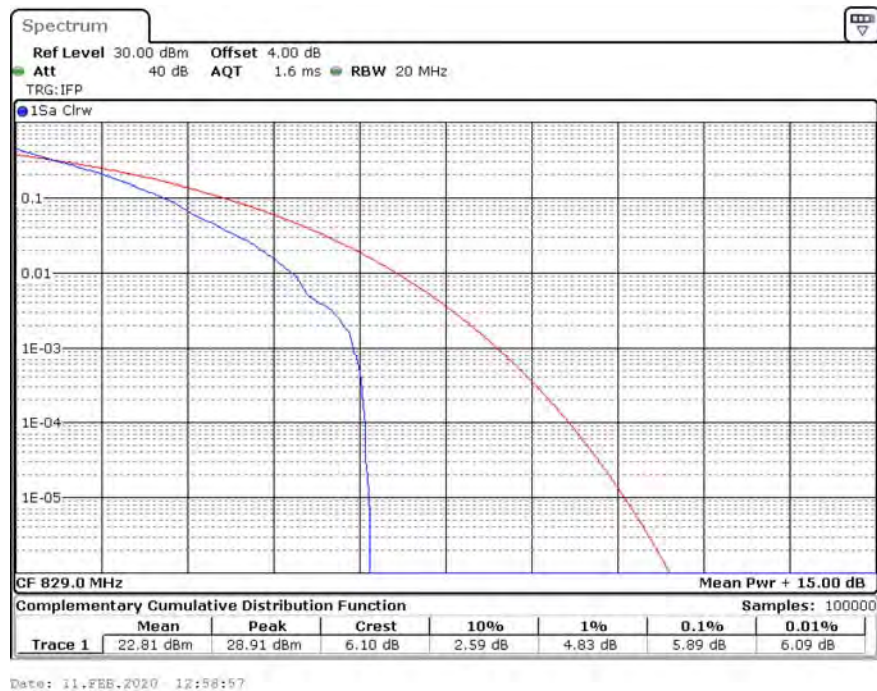
B26_CH26915_5M_1RB0_16-QAM_Ratio (Part 22)



B26_CH27015_5M_1RB5_16-QAM_Ratio (Part 22)



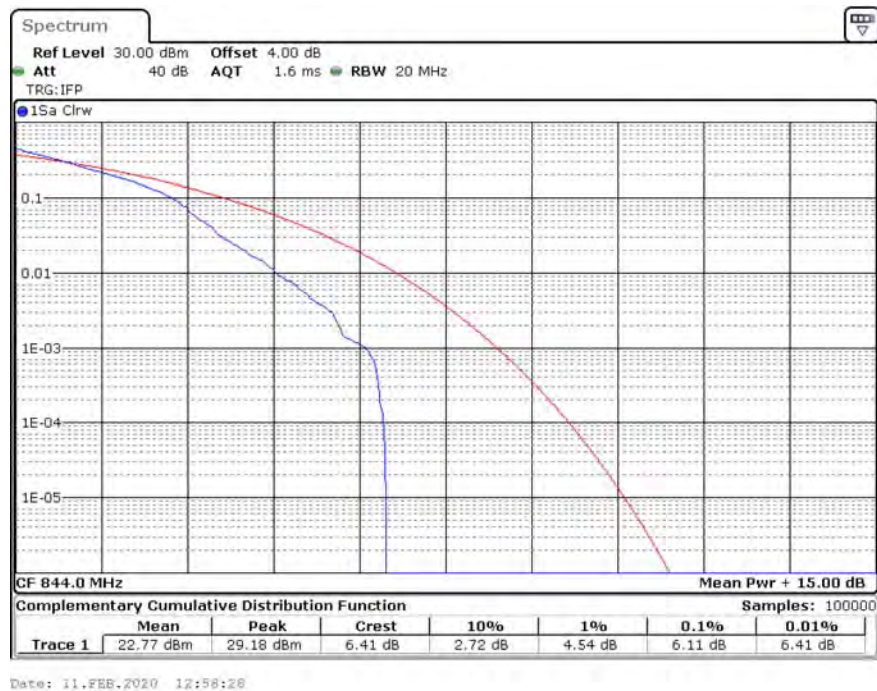
B26_CH26840_10M_1RB0_QPSK_Ratio (Part 22)



B26_CH26915_10M_1RB0_QPSK_Ratio (Part 22)



B26_CH26990_10M_1RB5_QPSK_Ratio (Part 22)



B26_CH26840_10M_1RB0_16-QAM_Ratio (Part 22)



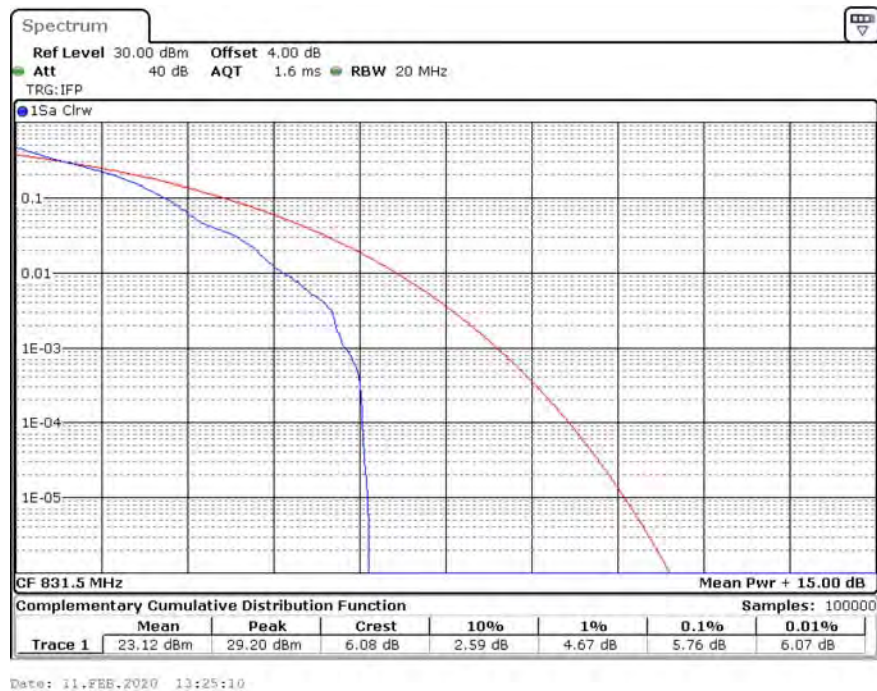
B26_CH26915_10M_1RB0_16-QAM_Ratio (Part 22)



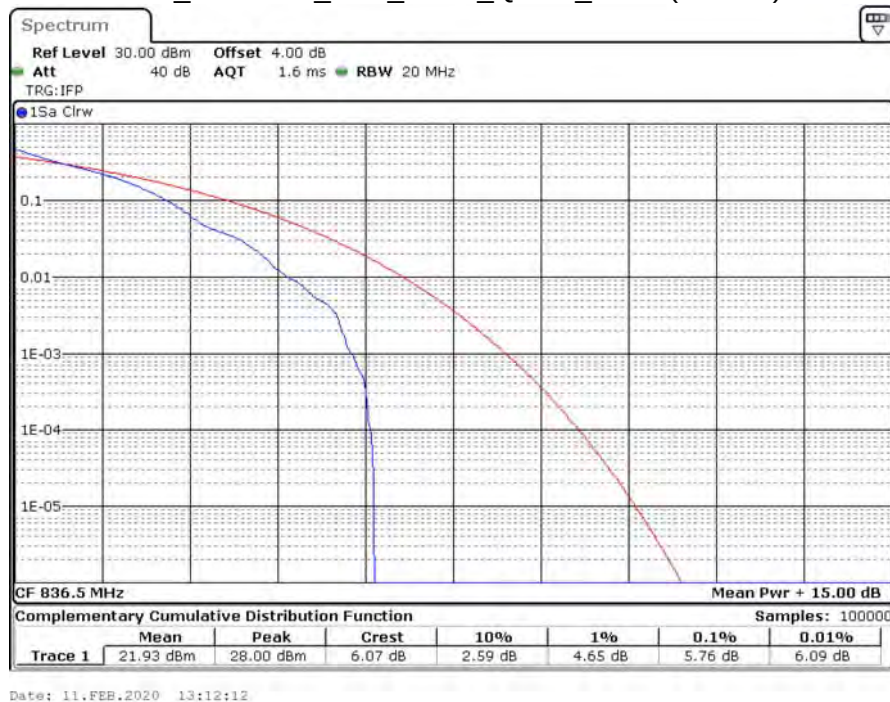
B26_CH26990_10M_1RB5_16-QAM_Ratio (Part 22)



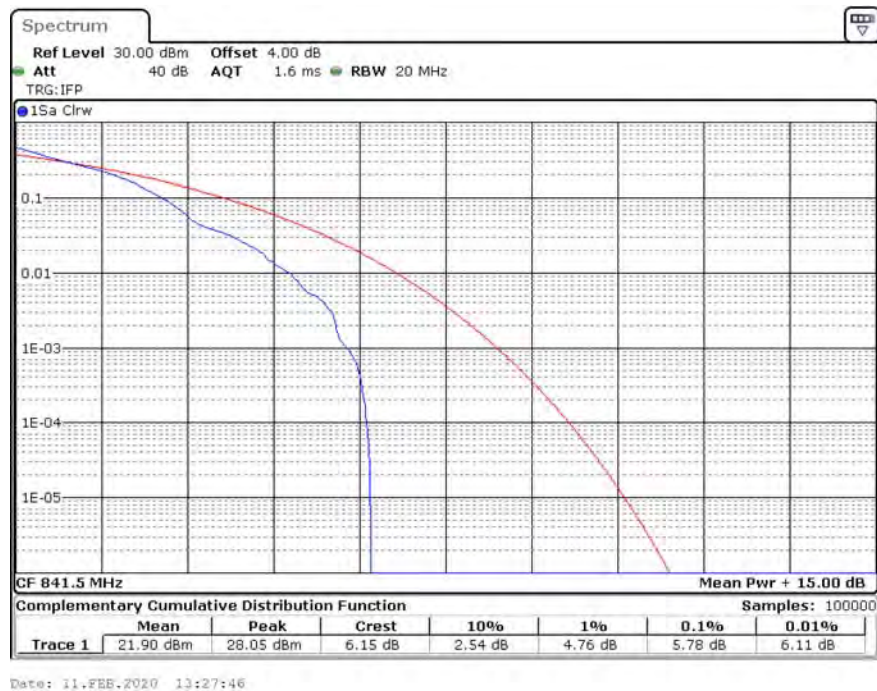
B26_CH26865_15M_1RB0_QPSK_Ratio (Part 22)



B26_CH26915_15M_1RB0_QPSK_Ratio (Part 22)



B26_CH26965_15M_1RB5_QPSK_Ratio (Part 22)



B26_CH26865_15M_1RB0_16-QAM_Ratio (Part 22)



B26_CH26915_15M_1RB0_16-QAM_Ratio (Part 22)



B26_CH26965_15M_1RB5_16-QAM_Ratio (Part 22)



Product	Module		
Test Item	Peak To Average Ratio (Part 90)		
Test Mode	Mode 7 : LTE Cat-M1_Band 26		
Date of Test	2020/02/10	Test Site	SR12-H
Temperature (°C)	18.0	Humidity (%RH)	55.0

Band width (MHz)	Channel	Freq. (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
1.4M	26697	814.7	QPSK	28.89	23.63	5.07
			16-QAM	29.77	22.28	7.17
	26740	819	QPSK	29.05	23.19	5.57
			16-QAM	28.31	21.89	6.09
	26783	823.3	QPSK	29.21	23.31	5.54
			16-QAM	27.60	21.67	5.98
3M	26705	815.5	QPSK	28.67	23.39	5.15
			16-QAM	29.60	22.09	7.17
	26740	819	QPSK	29.11	23.25	5.54
			16-QAM	27.94	21.89	5.67
	26775	822.5	QPSK	29.13	23.24	5.54
			16-QAM	27.86	21.94	5.80
5M	26715	816.5	QPSK	29.45	23.30	5.85
			16-QAM	30.19	23.10	6.83
	26740	819	QPSK	28.94	23.32	5.28
			16-QAM	30.40	23.47	6.74
	26765	821.5	QPSK	29.47	23.32	5.91
			16-QAM	29.96	23.59	6.22
10M	26740	819_1RB Low	QPSK	29.12	22.94	5.80
			16-QAM	29.76	22.90	6.63
	26740	819_1RB Low	QPSK	29.04	22.90	5.83
			16-QAM	29.68	22.67	6.72

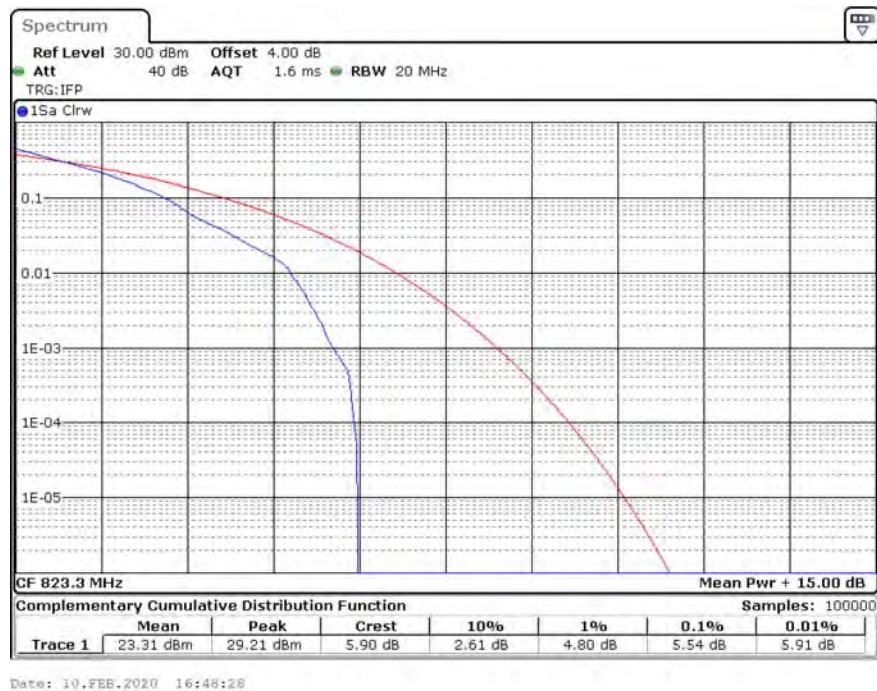
B26_CH26697_1.4M_1RB0_QPSK_Ratio (Part 90)



B26_CH26740_1.4M_1RB0_QPSK_Ratio (Part 90)



B26_CH26783_1.4M_1RB5_QPSK_Ratio (Part 90)



B26_CH26697_1.4M_1RB0_16-QAM_Ratio (Part 90)



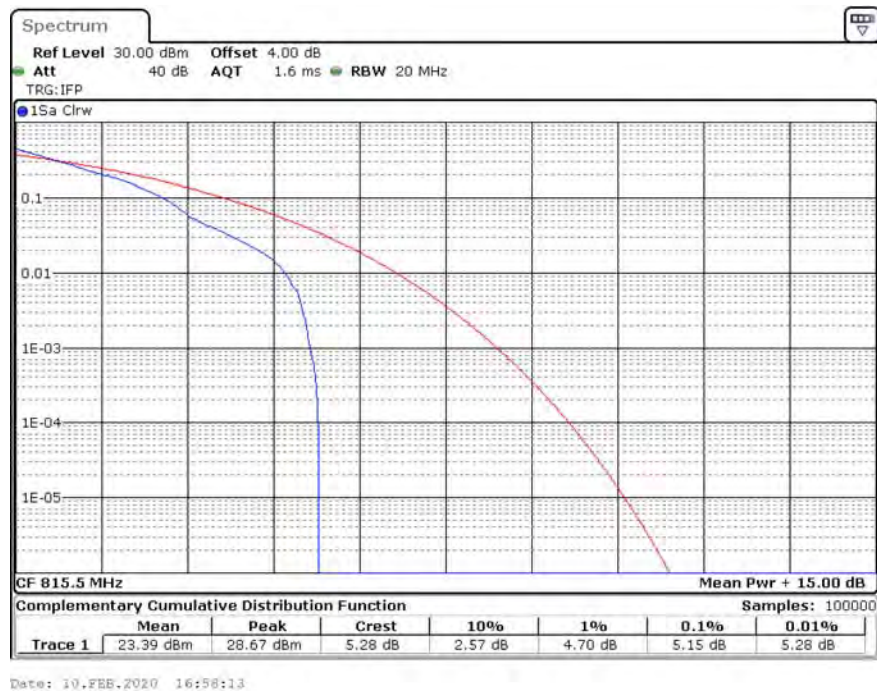
B26_CH26740_1.4M_1RB0_16-QAM_Ratio (Part 90)



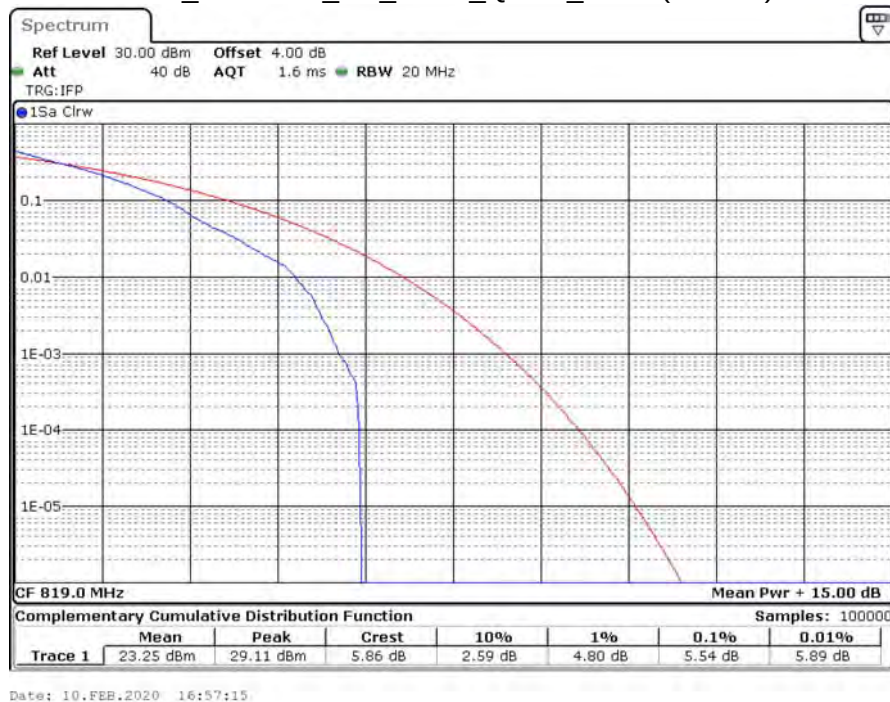
B26_CH26783_1.4M_1RB5_16-QAM_Ratio (Part 90)



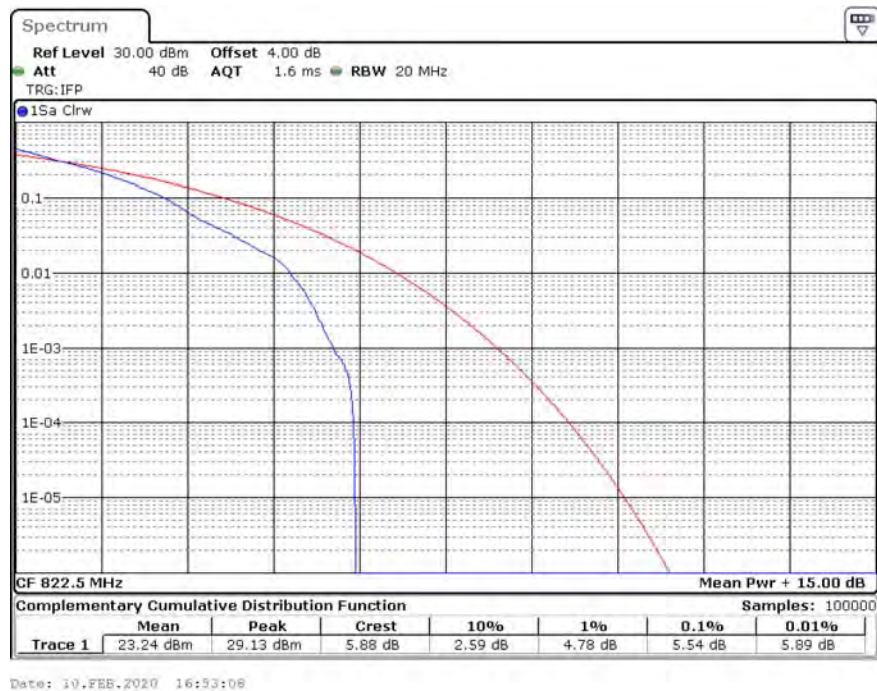
B26_CH26705_3M_1RB0_QPSK_Ratio (Part 90)



B26_CH26740_3M_1RB0_QPSK_Ratio (Part 90)



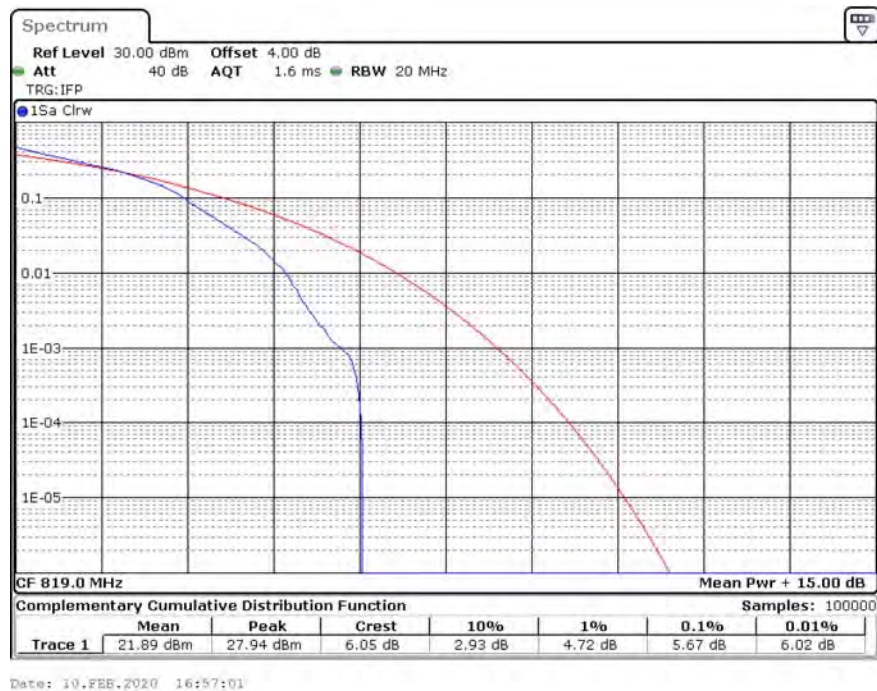
B26_CH26775_3M_1RB5_QPSK_Ratio (Part 90)



B26_CH26705_3M_1RB0_16-QAM_Ratio (Part 90)



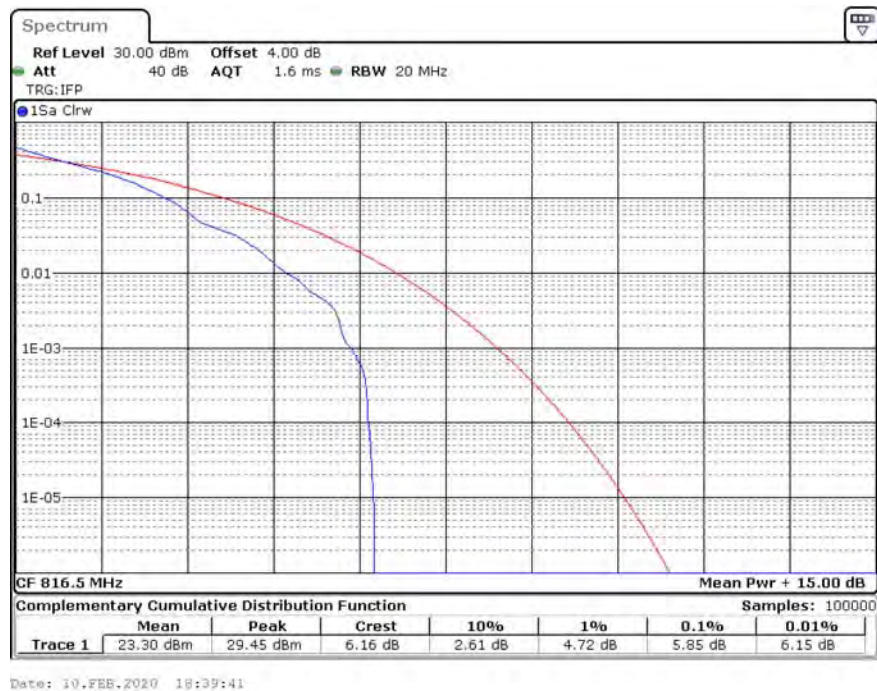
B26_CH26740_3M_1RB0_16-QAM_Ratio (Part 90)



B26_CH26775_3M_1RB5_16-QAM_Ratio (Part 90)



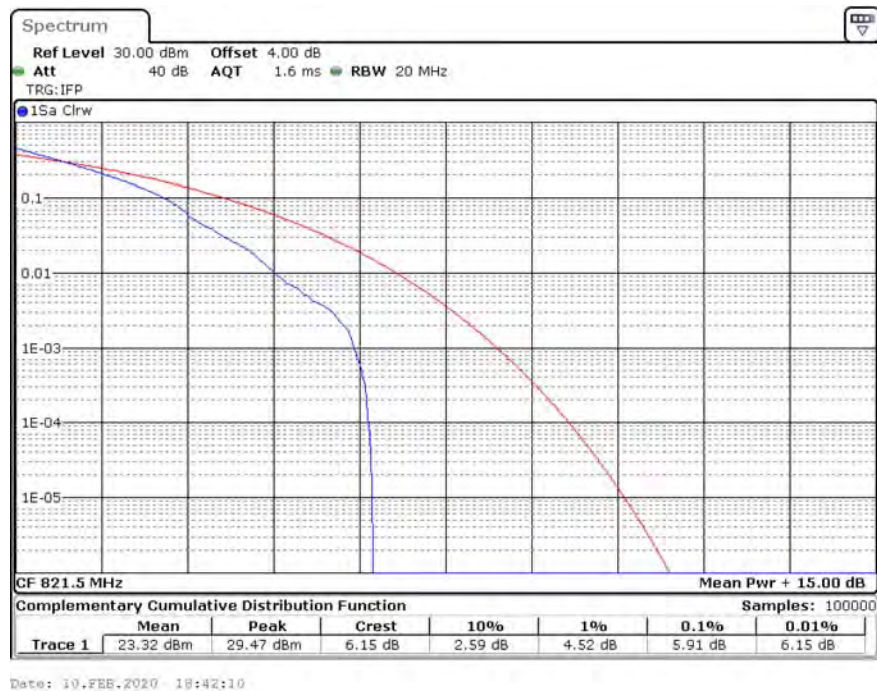
B26_CH26715_5M_1RB0_QPSK_Ratio (Part 90)



B26_CH26740_5M_1RB0_QPSK_Ratio (Part 90)



B26_CH26765_5M_1RB5_QPSK_Ratio (Part 90)



B26_CH26715_5M_1RB0_16-QAM_Ratio (Part 90)



B26_CH26740_5M_1RB0_16-QAM_Ratio (Part 90)



B26_CH26765_5M_1RB5_16-QAM_Ratio (Part 90)



B26_CH26740_10M_1RB0_QPSK__LOW_Ratio (Part 90)



B26_CH26740_10M_1RB0_QPSK_HIGH_Ratio (Part 90)



B26_CH26740_10M_1RB0_16-QAM_LOW_Ratio (Part 90)



B26_CH26740_10M_1RB0_16-QAM_HIGH_Ratio (Part 90)

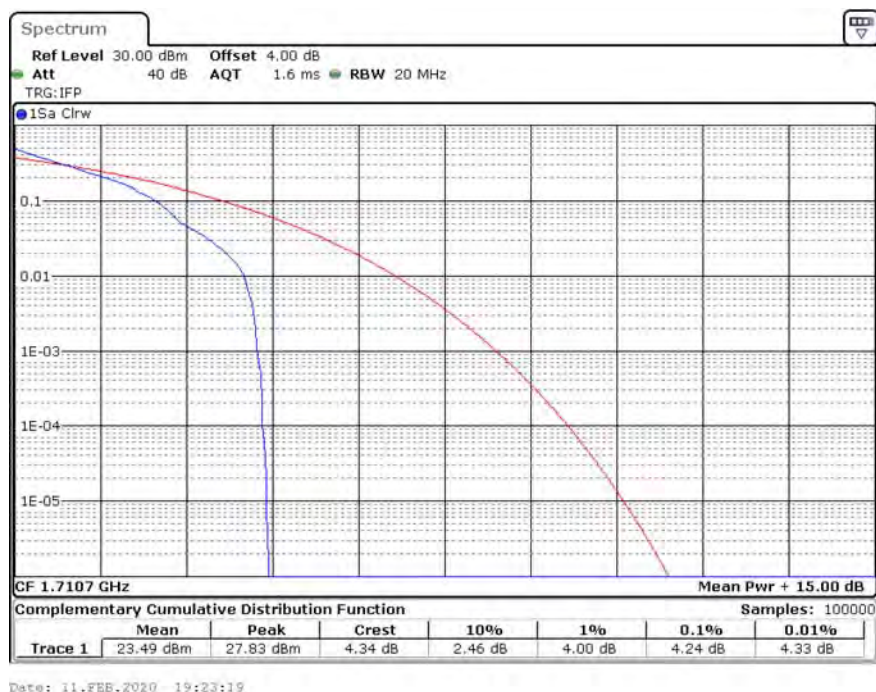


Product	Module		
Test Item	Peak To Average Ratio		
Test Mode	Mode 8 : LTE Cat-M1_Band 66		
Date of Test	2020/02/11~2020/02/12	Test Site	SR12-H
Temperature (°C)	20.0	Humidity (%RH)	56.0

Band width (MHz)	Channel	Freq. (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
1.4M	131979	1710.7	QPSK	27.83	23.49	4.24
			16-QAM	28.28	22.25	5.85
	132322	1745	QPSK	26.78	21.38	5.24
			16-QAM	26.81	21.43	5.24
	132665	1779.3	QPSK	27.93	22.97	4.83
			16-QAM	27.76	22.19	5.35
3M	131987	1711.5	QPSK	28.01	23.11	4.70
			16-QAM	27.10	21.79	5.17
	132322	1745	QPSK	27.94	23.06	4.67
			16-QAM	27.12	21.83	5.15
	132657	1778.5	QPSK	27.58	23.25	4.26
			16-QAM	27.95	22.05	5.72
5M	131997	1712.5	QPSK	28.06	23.03	4.85
			16-QAM	28.40	22.83	5.41
	132322	1745	QPSK	28.00	23.09	4.74
			16-QAM	28.28	22.79	5.37
	132647	1777.5	QPSK	27.99	22.99	4.83
			16-QAM	28.24	22.97	5.17
10M	132022	1715	QPSK	27.90	22.73	4.96
			16-QAM	28.20	22.73	5.35
	132322	1745	QPSK	27.64	22.63	4.83
			16-QAM	27.94	22.45	5.35
	132622	1775	QPSK	27.63	22.50	4.72
			16-QAM	27.66	22.35	5.17

Band width (MHz)	Channel	Freq. (MHz)	Modulation	Peak (dBm)	Average (dBm)	PAPR (dB)
15M	132047	1717.5	QPSK	26.95	21.90	4.85
			16-QAM	27.31	21.70	5.41
	132322	1745	QPSK	26.94	21.96	4.78
			16-QAM	27.24	21.78	5.30
	132597	1772.5	QPSK	26.72	21.72	4.83
			16-QAM	26.97	21.68	5.17
20M	132072	1720	QPSK	26.05	20.99	4.85
			16-QAM	26.35	20.76	5.41
	132322	1745	QPSK	26.02	21.02	4.80
			16-QAM	26.31	20.84	5.30
	132572	1770	QPSK	25.87	20.87	4.83
			16-QAM	26.13	20.84	5.17

B66_CH131979_1.4M_1RB0_QPSK_Ratio



B66_CH132322_1.4M_1RB0_QPSK_Ratio



B66_CH132665_1.4M_1RB5_QPSK_Ratio



B66_CH131979_1.4M_1RB0_16-QAM_Ratio



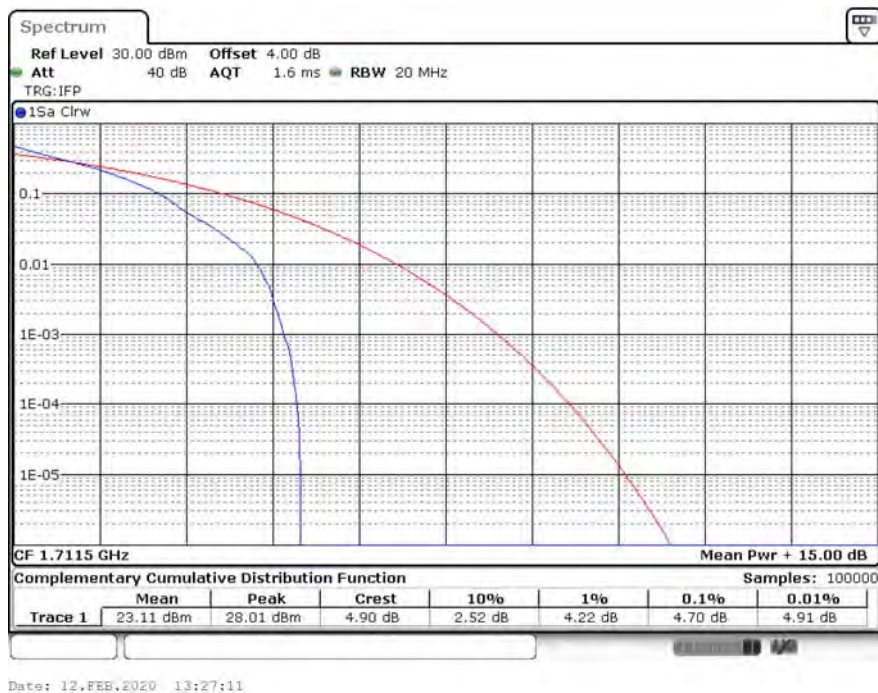
B66_CH132322_1.4M_1RB0_16-QAM_Ratio



B66_CH132665_1.4M_1RB5_16-QAM_Ratio



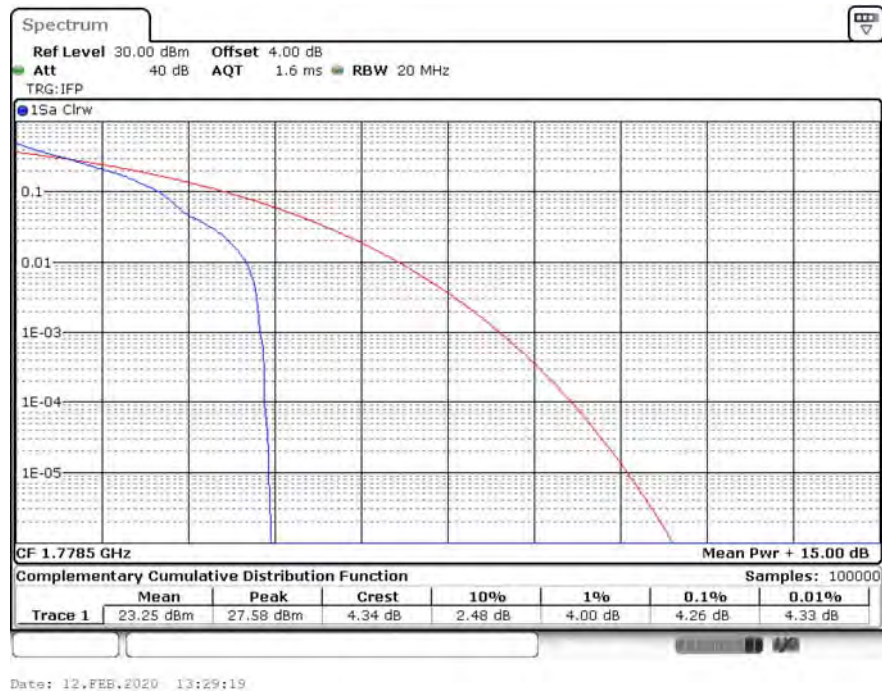
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B66_CH132322_3M_1RB0_QPSK_Ratio



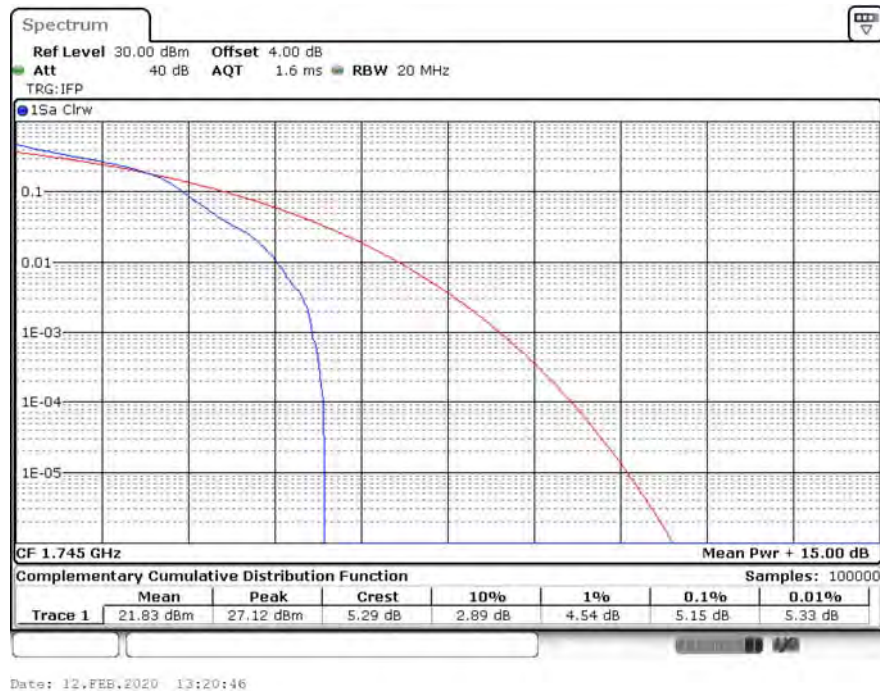
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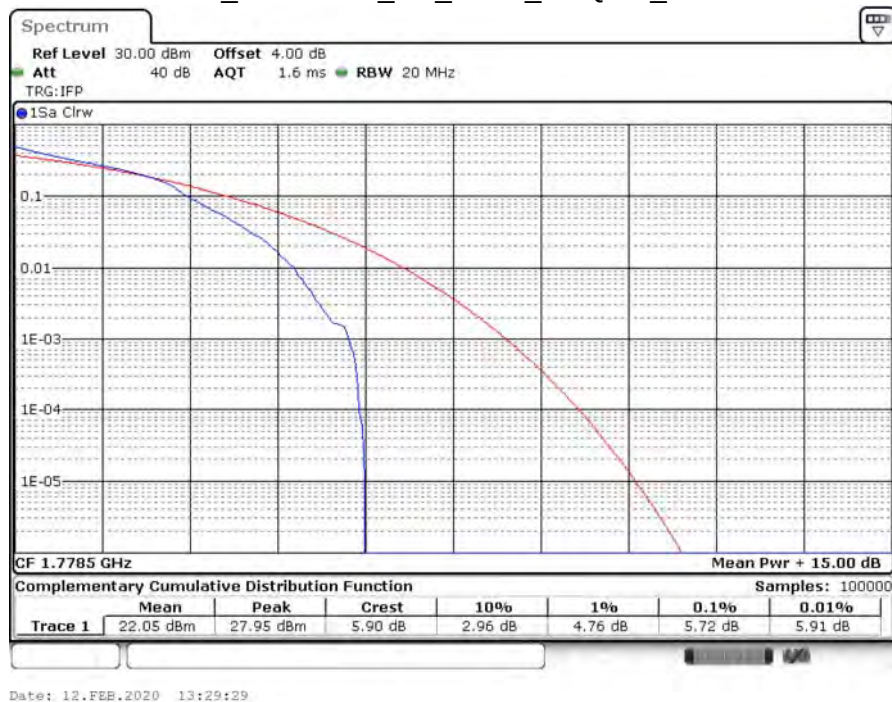
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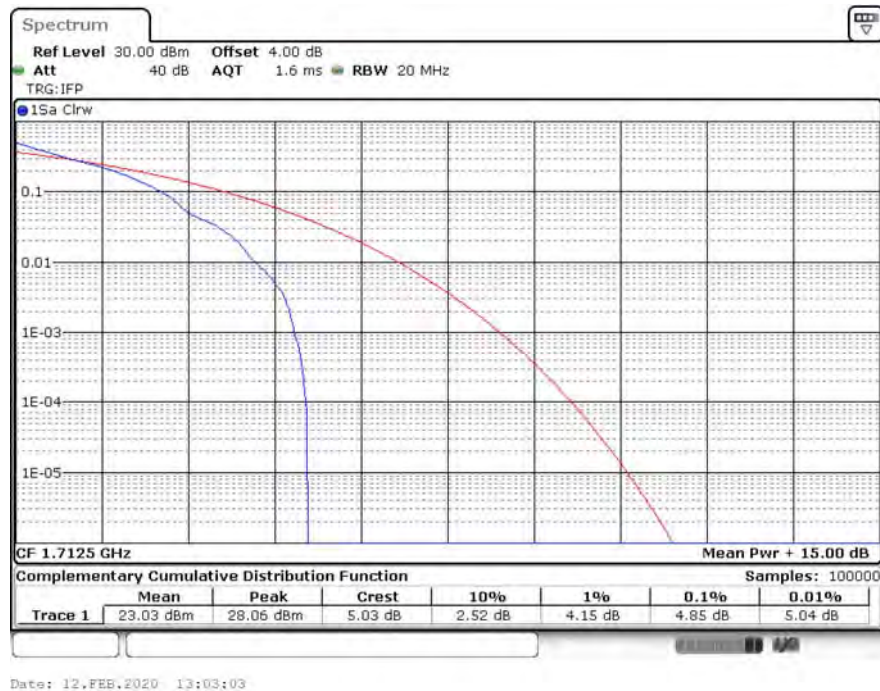
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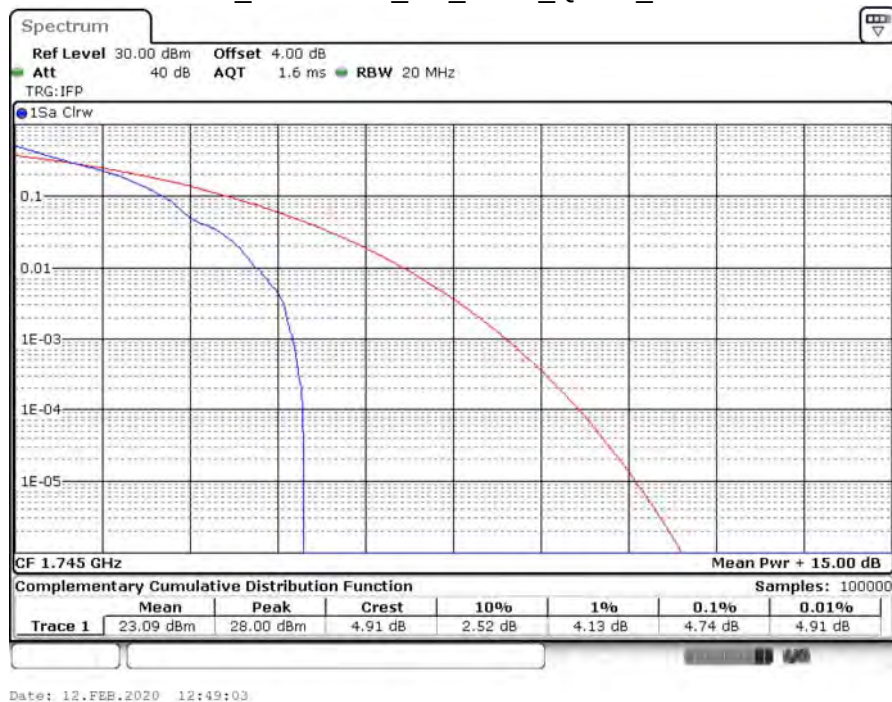
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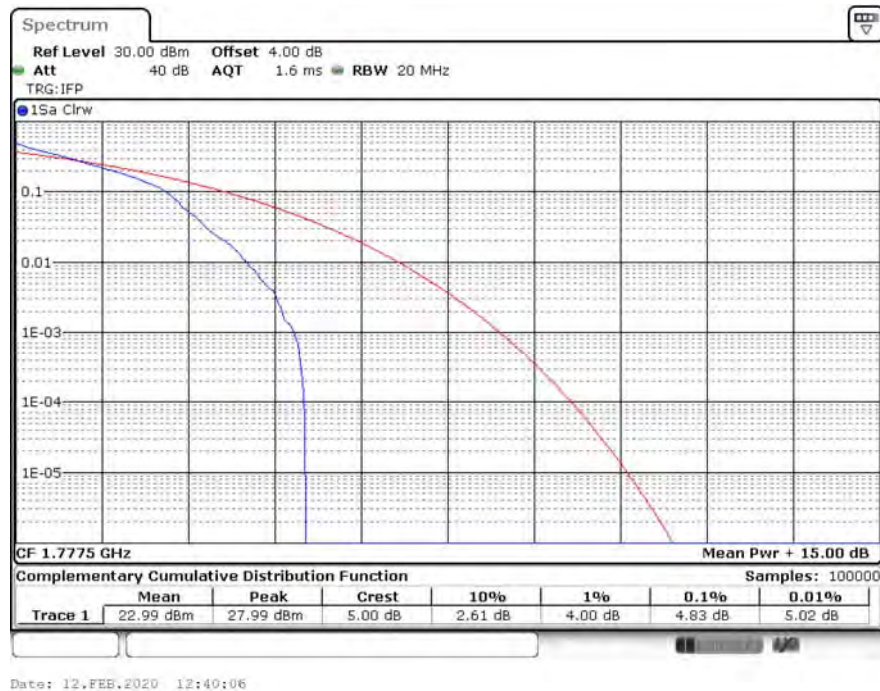
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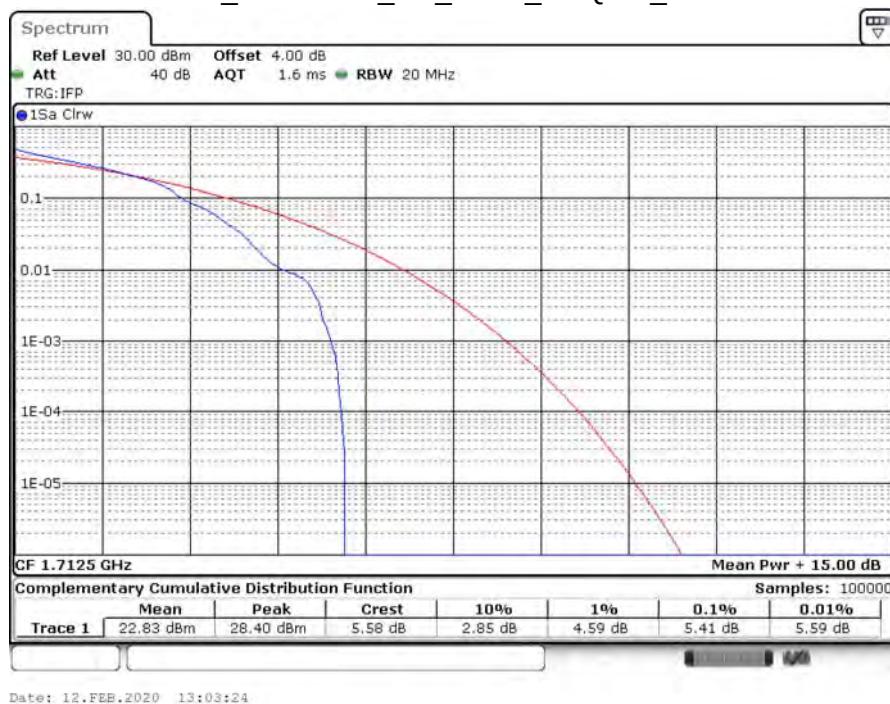
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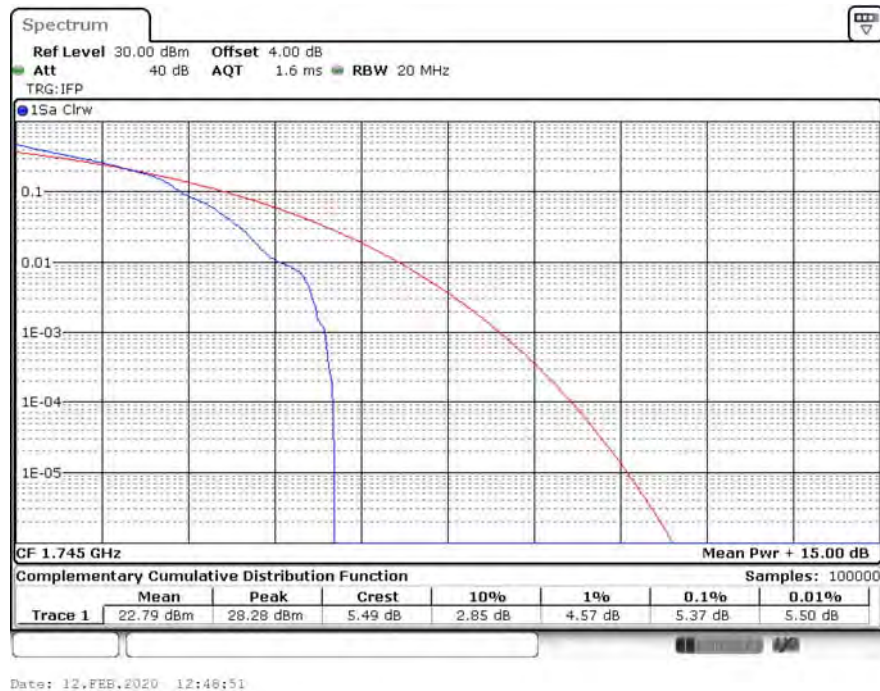
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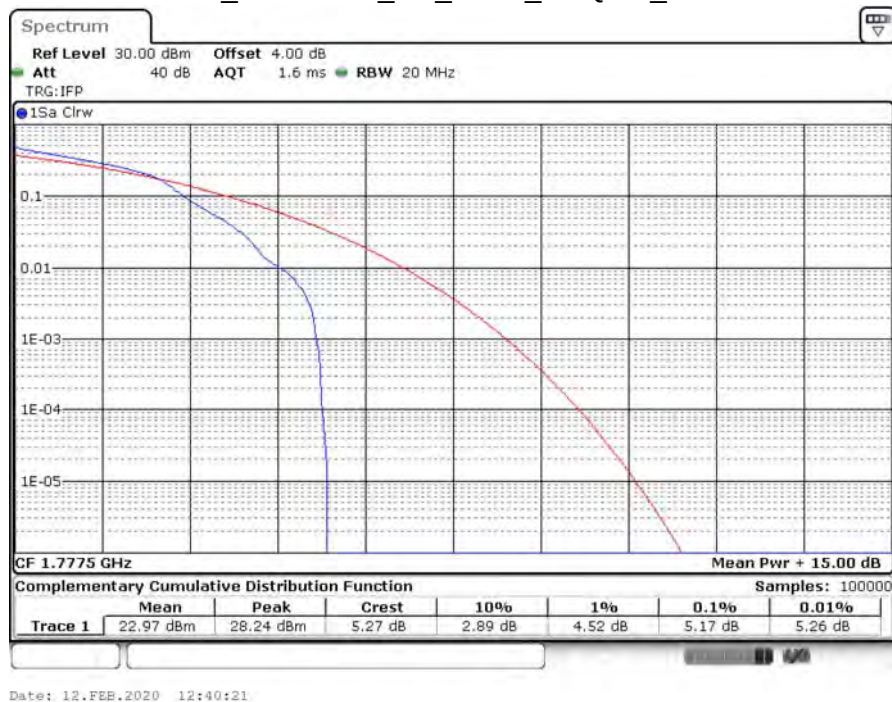
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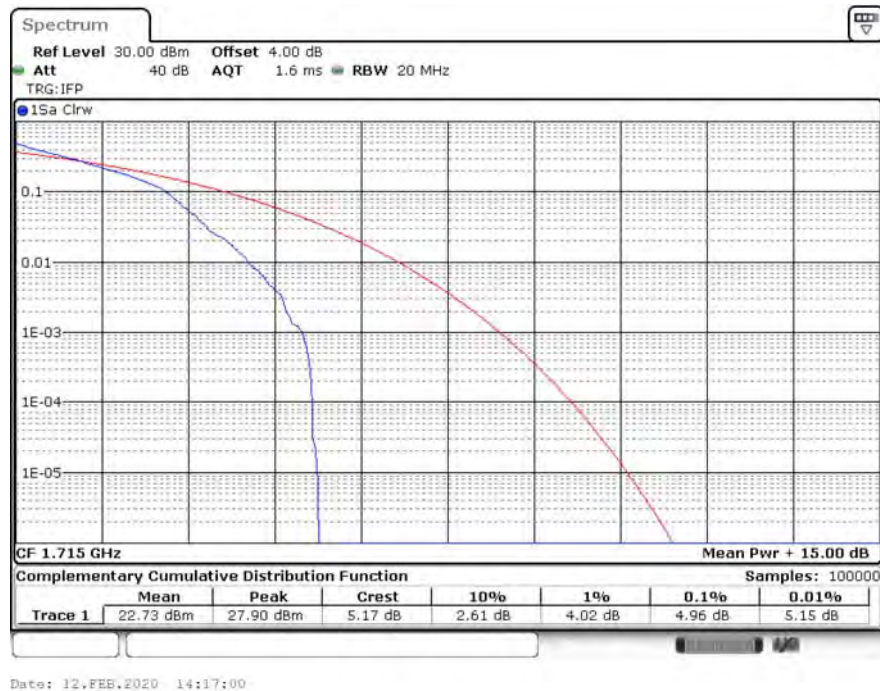
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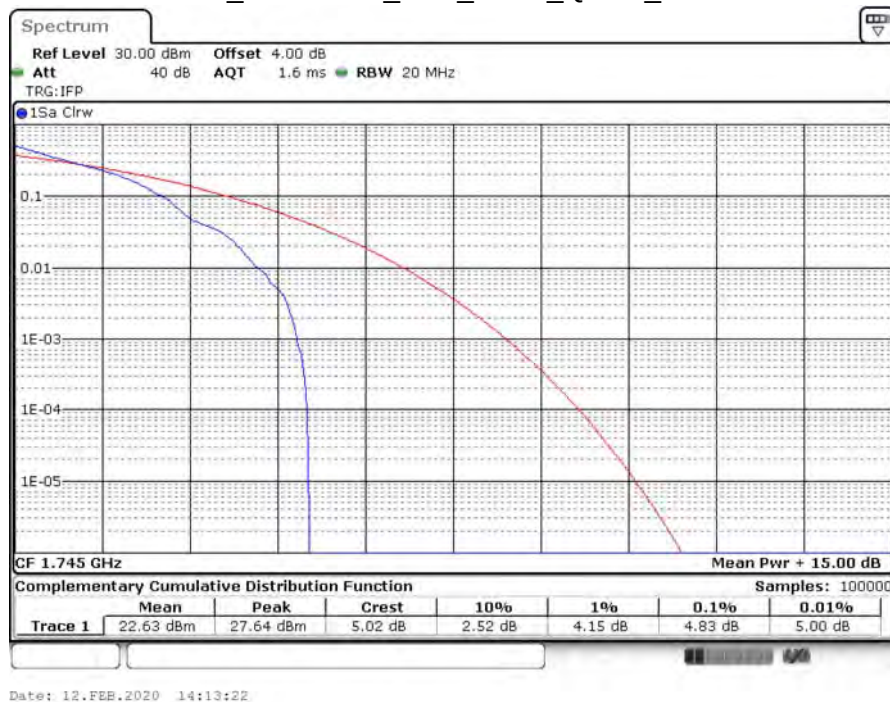
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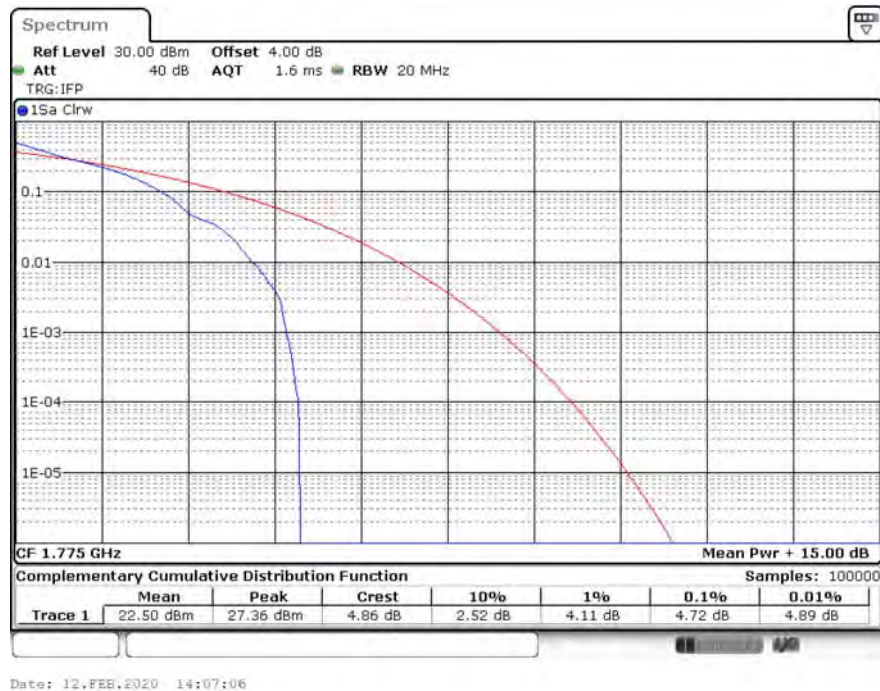
B66_CH132022_10M_1RB0_QPSK_Ratio



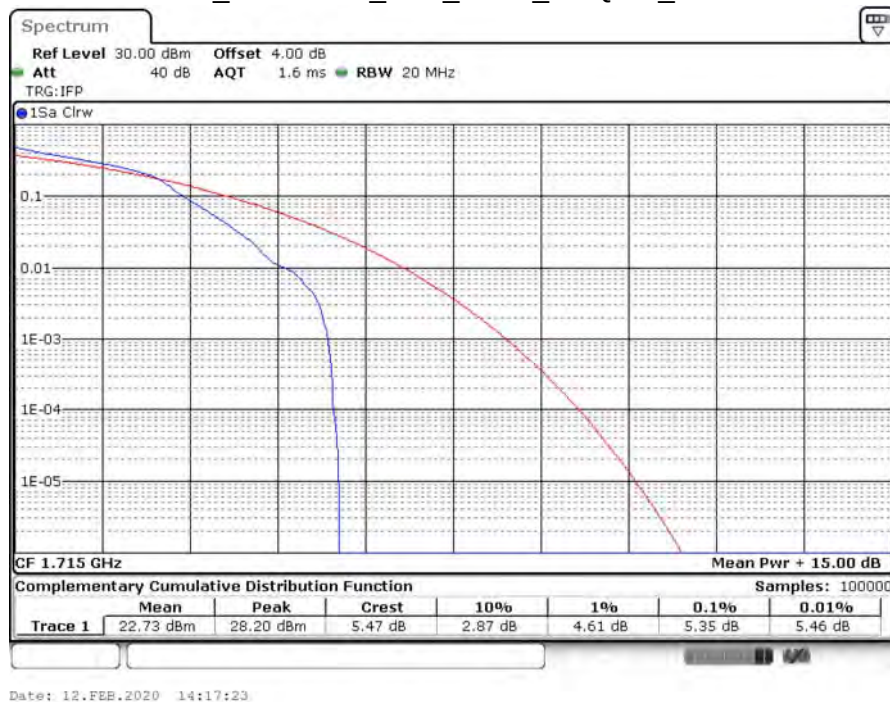
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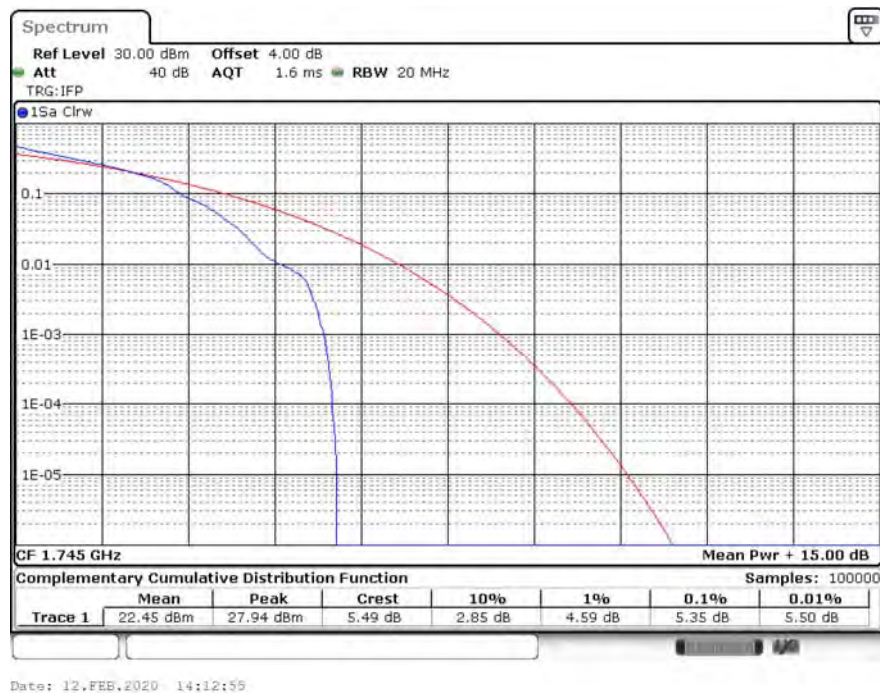
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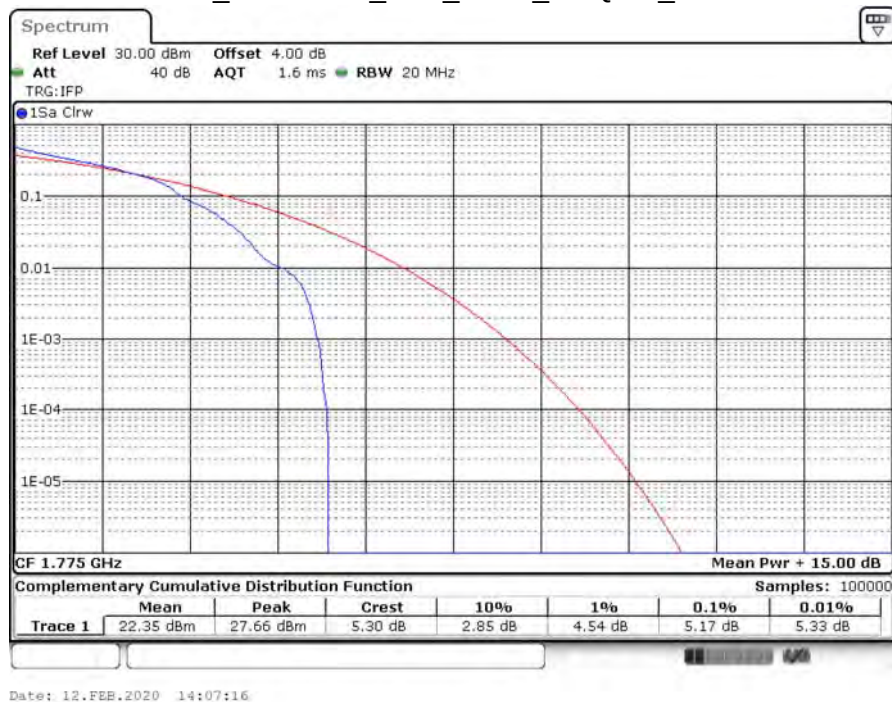
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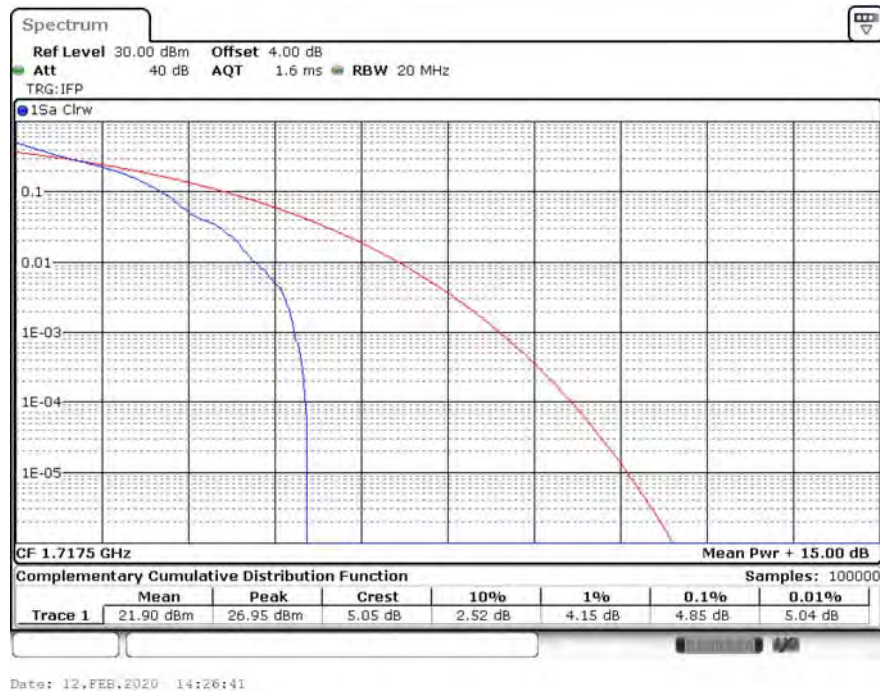
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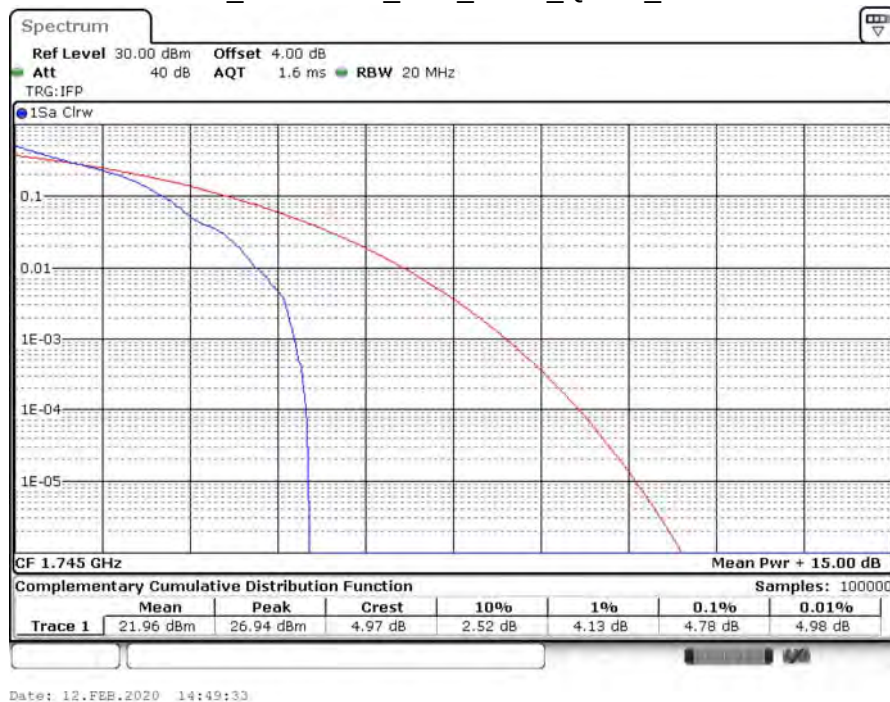
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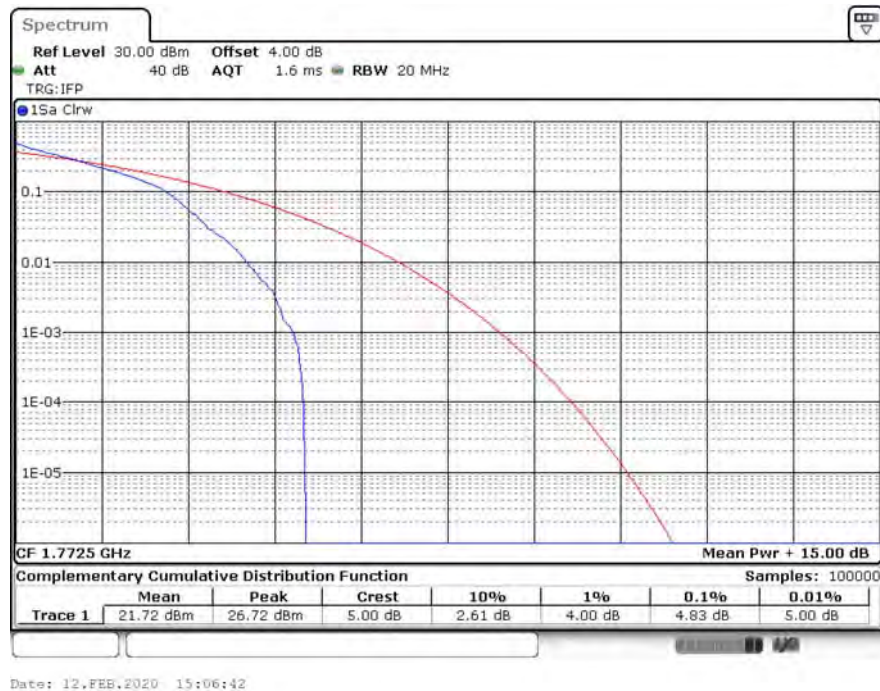
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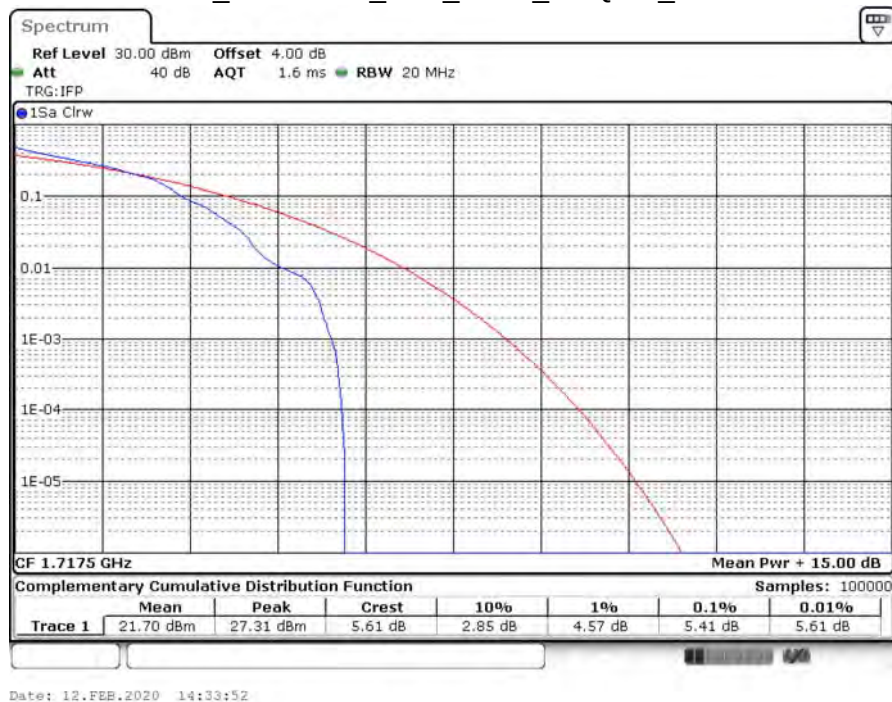
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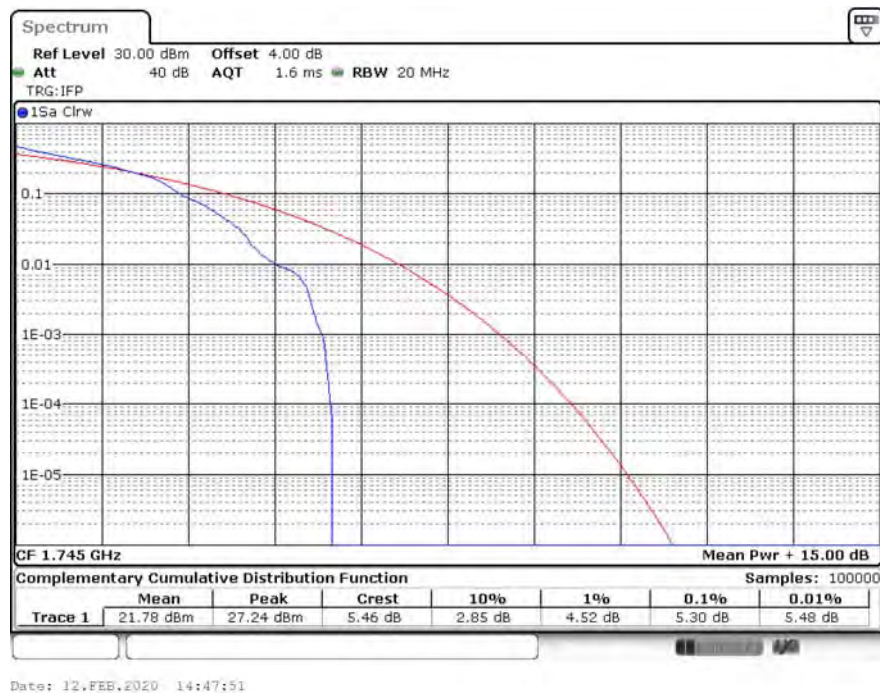
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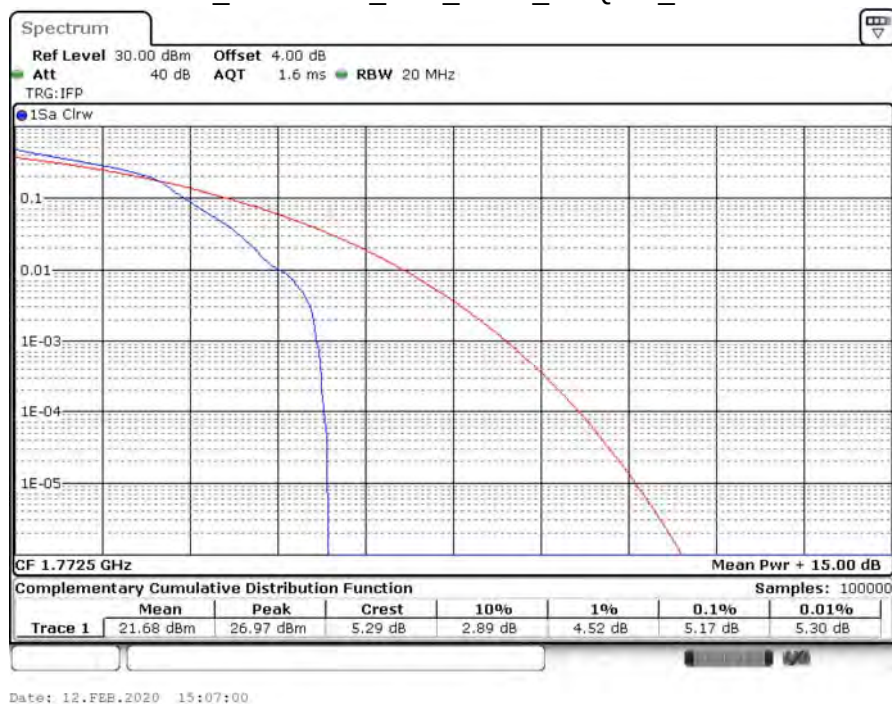
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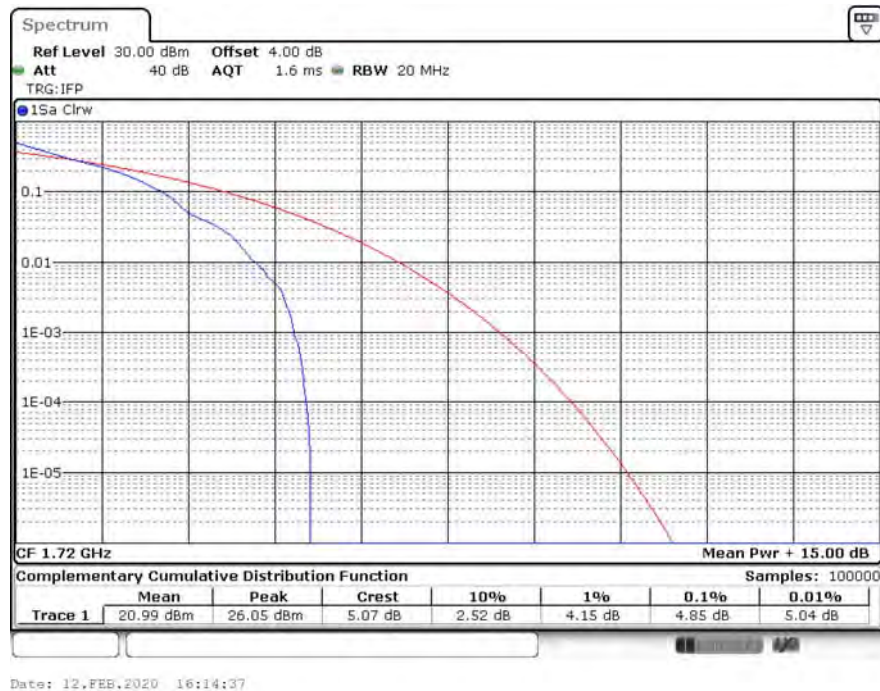
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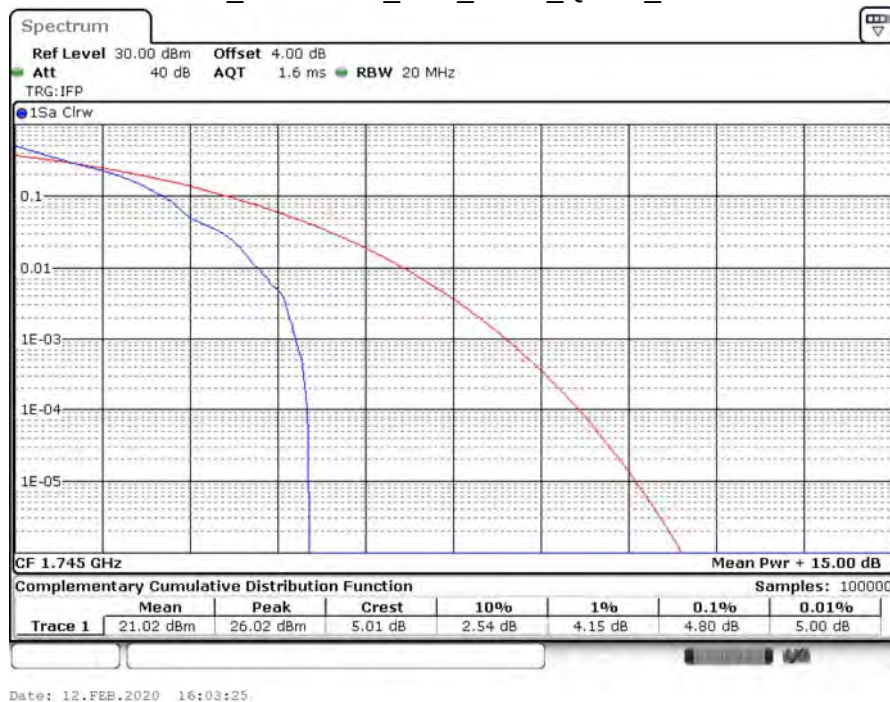
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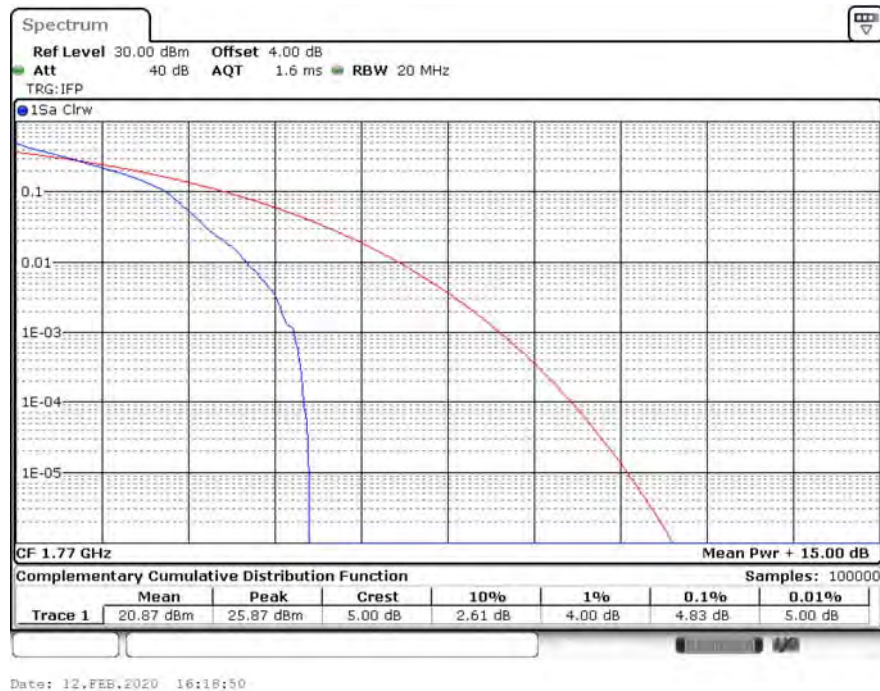
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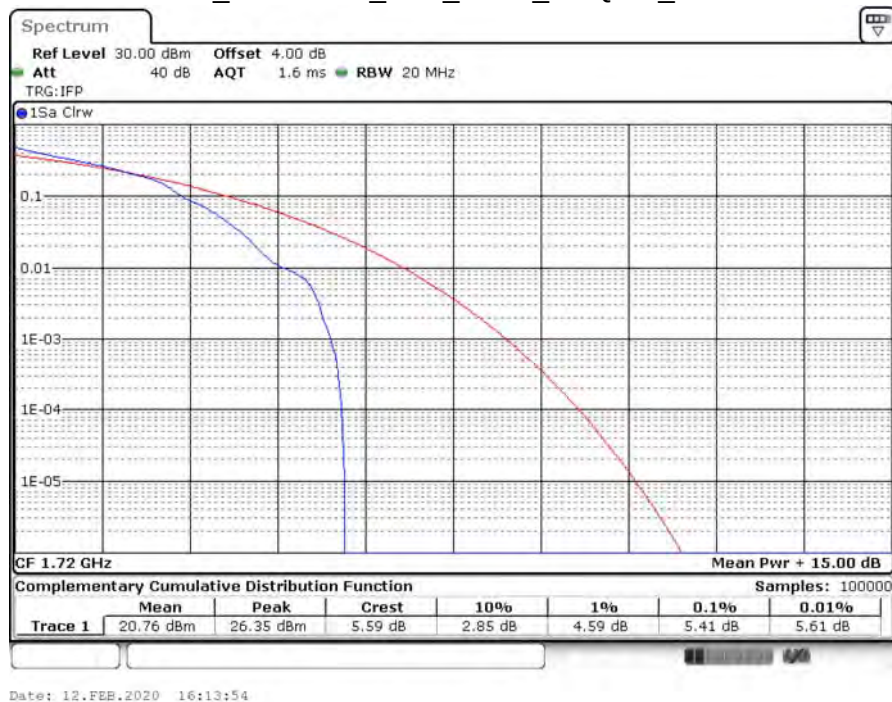
B66_CH132322_20M_1RB0_QPSK_Ratio



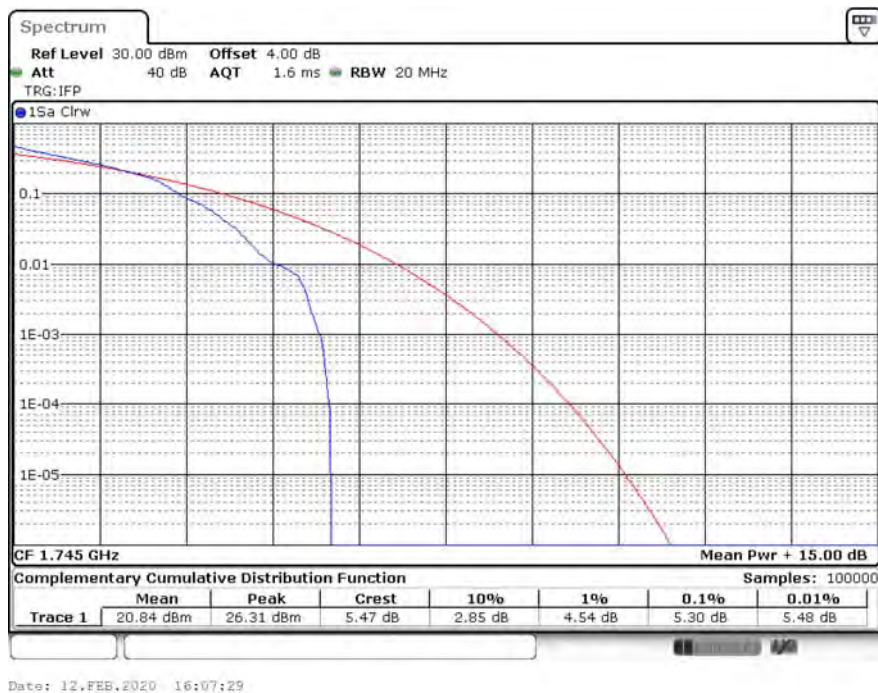
B66_CH132572_20M_1RB5_QPSK_Ratio



B66_CH132072_20M_1RB0_16-QAM_Ratio



B66_CH132322_20M_1RB0_16-QAM_Ratio



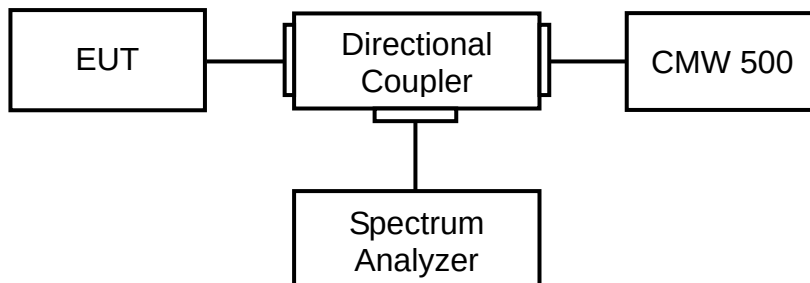
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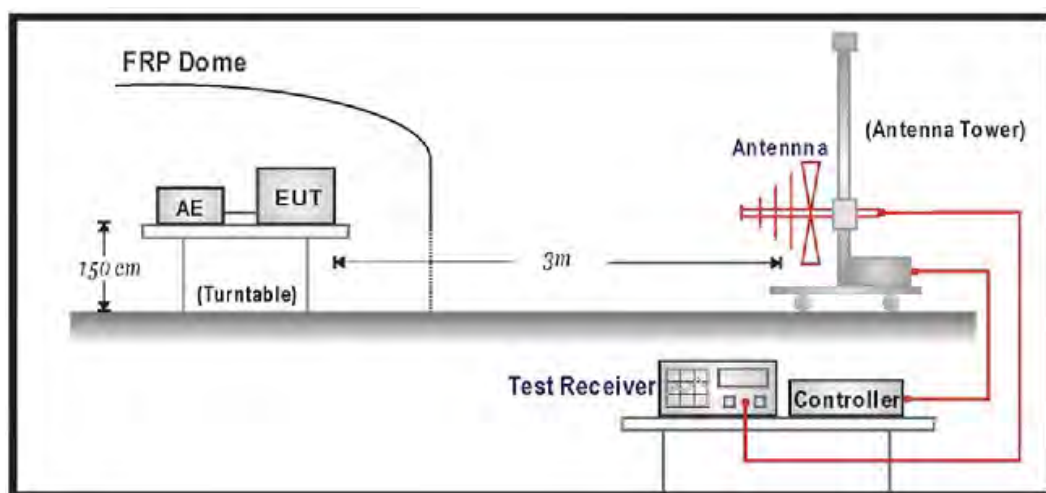
6. Spurious Emissions

6.1. Test Setup

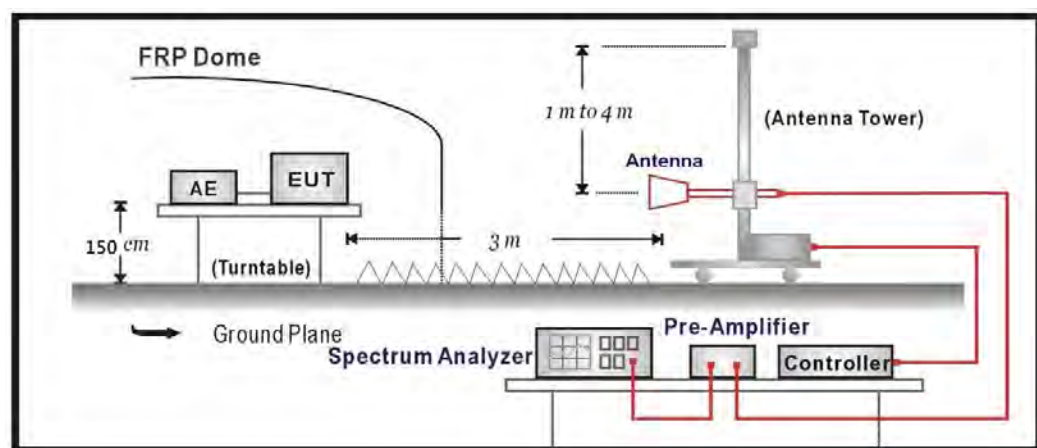
Conducted Spurious Measurement:



Radiated Spurious Measurement (below 1GHz)



Radiated Spurious Measurement (above 1GHz)



6.2. Test Procedure

Conducted Spurious Measurement:

- a) Place the EUT on a bench and set it in transmitting mode.
- b) Connect a low loss RF cable from the antenna port to a spectrum analyzer and CMW500 by a Directional Couple.
- c) EUT Communicate with CMW500, then select a channel for testing.
- d) Add a correction factor to the display of spectrum, and then test.
- e) The resolution bandwidth of the spectrum analyzer was set at 1 MHz, sufficient scans were taken to show the out of band Emission if any up to 10th harmonic.

Radiated Spurious Measurement:

- a) The EUT was placed on a rotatable wooden table with 1.5 meter above ground.
- b) The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
- c) The table was rotated 360 degrees to determine the position of the highest spurious emission.
- d) The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
- e) Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 1MHz, Sweep 500ms, Taking the record of maximum spurious emission.
- f) A horn antenna was substituted in place of the EUT and was driven by a signal generator.
- g) Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
- h) Taking the record of output power at antenna port
- i) Repeat step 7 to step 8 for another polarization.
- j) $EIRP = SG - \text{Cable loss} + \text{Antenna Gain}$

6.3. Test Method

Conducted Spurious Measurement:

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 6.1
ANSI C63.26: 2015 Sub-clause 5.7

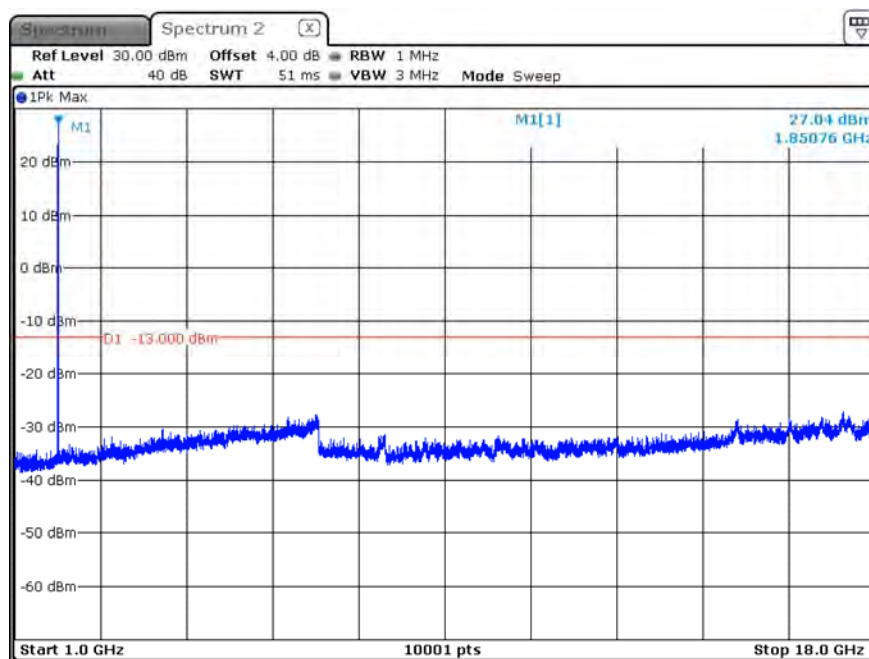
Radiated Spurious Measurement:

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 5.8
ANSI C63.26: 2015 Sub-clause 5.5.3.2

6.4. Test Result

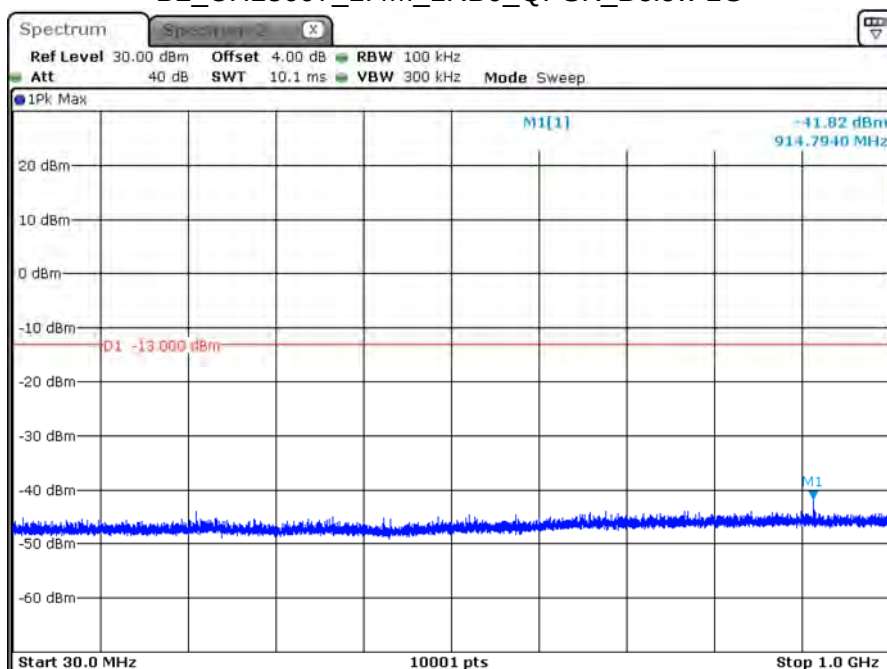
Product	Module		
Test Item	Conducted Spurious Emissions		
Test Mode	Mode 1 : LTE Cat-M1_Band 2		
Date of Test	2020/02/13	Test Site	SR12-H
Temperature (°C)	22.0	Humidity (%RH)	62.0

B2_CH18607_1.4M_1RB0_QPSK_Above 1G



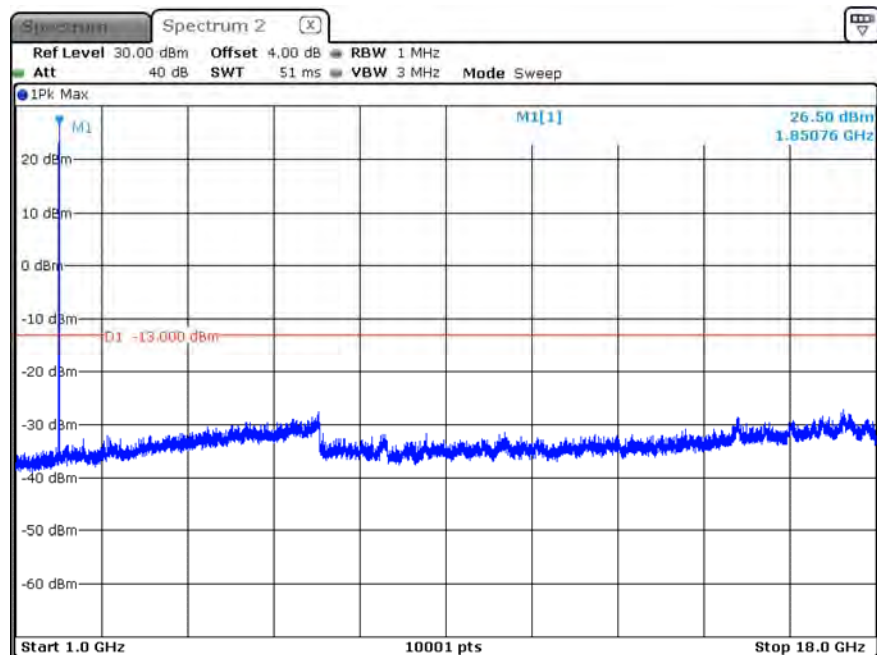
Date: 13.FEB.2020 14:46:33

B2_CH18607_1.4M_1RB0_QPSK_Below 1G



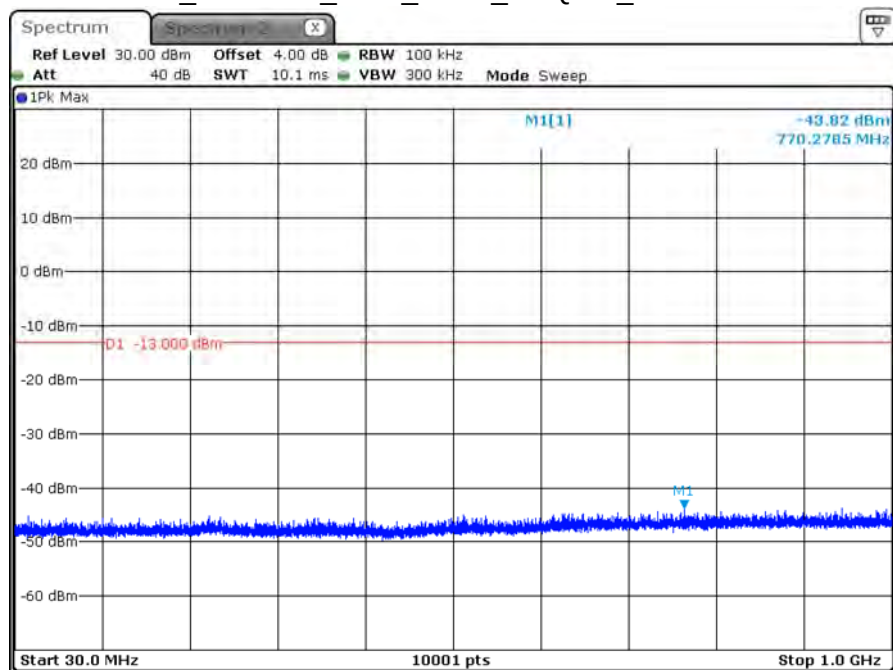
Date: 13.FEB.2020 14:52:16

B2_CH18607_1.4M_1RB0_16-QAM_Above 1G



Date: 13.FEB.2020 14:42:36

B2_CH18607_1.4M_1RB0_16-QAM_Below 1G



Date: 13.FEB.2020 14:41:57