5. Peak-Average Ratio

5.1. Limit

- §22.913(d) Measurement of the ERP of Cellular base transmitters and repeaters must be made using an average power measurement technique. The peak-to-average ratio (PAR) of the transmission must not exceed 13 ㎧.

- §24.232(d), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 ㎧.

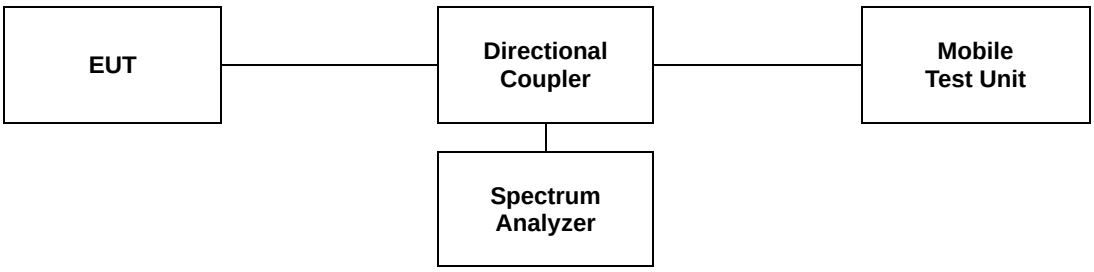
- §27.50(d)(5), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (d)(6) of this section. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 ㎧.

5.2. Test Procedure

The test follows section 5.7.2 of FCC KDB Publication 971168 D01 v03r01.

See instrumentation-specific application literature for further guidance regarding use of the CCDF capability. The following guidelines are offered for performing a CCDF measurement.

a. Set resolution/measurement bandwidth ≥ OBW or specified reference bandwidth.
b. Set the number of counts to a value that stabilizes the measured CCDF curve.
c. Set the measurement interval as follows:
  1) For continuous transmissions, set to greater of [10 x (number of points in sweep) x (transmission symbol period)] or 1 ㎳.
  2) For burst transmissions, employ an external trigger that is synchronized with the EUT burst timing sequence, or use the internal burst trigger with a trigger level that allows the burst to stabilize. Set the measurement interval to a time that is less than or equal to the burst duration.
  3) If there are several carriers in a single antenna port, the peak power shall be determined for each individual carrier (by disabling the other carriers while measuring the required carrier) and the total peak power calculated from the sum of the individual carrier peak powers.
d. Record the maximum PAPR level associated with a probability of 0.1 %.
e. The peak power level is calculated form the sum of the PAPR value from step d) to the measured average power.



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5.3 Test Results

Ambient temperature : (23 ± 1) ℃
Relative humidity : 47 % R.H.

Band	Mode	Frequency (㎒)	PAR (㏈)
2 (1.4 ㎒)	QPSK	1 850.7	4.67
		1 880.0	4.84
		1 909.3	4.84
2 (3 ㎒)	QPSK	1 851.5	4.58
		1 880.0	4.49
		1 908.5	4.58
2 (5 ㎒)	QPSK	1 852.5	4.67
		1 880.0	4.61
		1 907.5	4.55
2 (10 ㎒)	QPSK	1 855.0	4.64
		1 880.0	4.52
		1 905.0	4.58
2 (15 ㎒)	QPSK	1 857.5	4.99
		1 880.0	4.75
		1 902.5	4.78
2 (20 ㎒)	QPSK	1 860.0	4.70
		1 880.0	4.52
		1 900.0	4.61

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Band	Mode	Frequency (㎒)	PAR (㏈)
4 (1.4 ㎒)	QPSK	1 710.7	4.75
		1 732.5	5.25
		1 754.3	5.28
4 (3 ㎒)	QPSK	1 711.5	4.49
		1 732.5	4.90
		1 753.5	4.90
4 (5 ㎒)	QPSK	1 712.5	4.61
		1 732.5	4.93
		1 752.5	4.93
4 (10 ㎒)	QPSK	1 715.0	4.70
		1 732.5	4.93
		1 750.0	4.81
4 (15 ㎒)	QPSK	1 717.5	5.13
		1 732.5	5.13
		1 747.5	4.99
4 (20 ㎒)	QPSK	1 720.0	4.96
		1 732.5	4.75
		1 745.0	4.61

Band	Mode	Frequency (㎒)	PAR (㏈)
5 (1.4 ㎒)	QPSK	824.7	4.96
		836.5	5.07
		848.3	4.99
5 (3 ㎒)	QPSK	825.5	4.90
		836.5	4.87
		847.5	4.87
5 (5 ㎒)	QPSK	826.5	4.90
		836.5	4.96
		846.5	5.01
5 (10 ㎒)	QPSK	829.0	4.90
		836.5	4.90
		844.0	4.90

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LTE Band	Mode	Frequency (㎒)	PAR (㏈)
7 (5 ㎒)	QPSK	2 502.5	4.99
		2 535.0	5.07
		2 567.5	4.87
7 (10 ㎒)	QPSK	2 505.0	4.90
		2 535.0	5.04
		2 565.0	4.93
7 (15 ㎒)	QPSK	2 507.5	5.33
		2 535.0	5.45
		2 562.5	5.39
7 (20 ㎒)	QPSK	2 510.0	4.99
		2 535.0	5.10
		2 560.0	4.90

Band	Mode	Frequency (㎒)	PAR (㏈)
12 (1.4 ㎒)	QPSK	699.7	5.07
		707.5	5.28
		715.3	5.16
12 (3 ㎒)	QPSK	700.5	4.90
		707.5	4.96
		714.5	4.84
12 (5 ㎒)	QPSK	701.5	5.04
		707.5	5.04
		713.5	4.93
12 (10 ㎒)	QPSK	704.0	5.04
		707.5	4.99
		711.0	4.96

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Band	Mode	Frequency (㎒)	PAR (㏈)
26 (1.4 ㎒)	QPSK	824.7	4.87
		836.5	4.78
		848.3	4.64
26 (3 ㎒)	QPSK	825.5	4.72
		836.5	4.70
		847.5	4.61
26 (5 ㎒)	QPSK	826.5	4.72
		836.5	4.70
		846.5	4.12
26 (10 ㎒)	QPSK	829.0	4.72
		836.5	4.72
		844.0	4.81
26 (15 ㎒)	QPSK	831.5	5.07
		841.5	5.16

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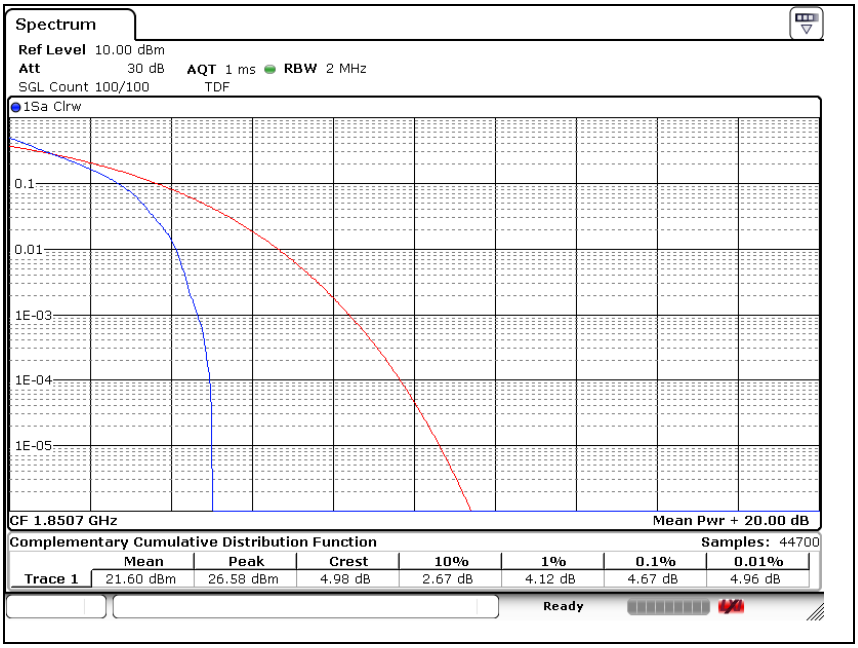
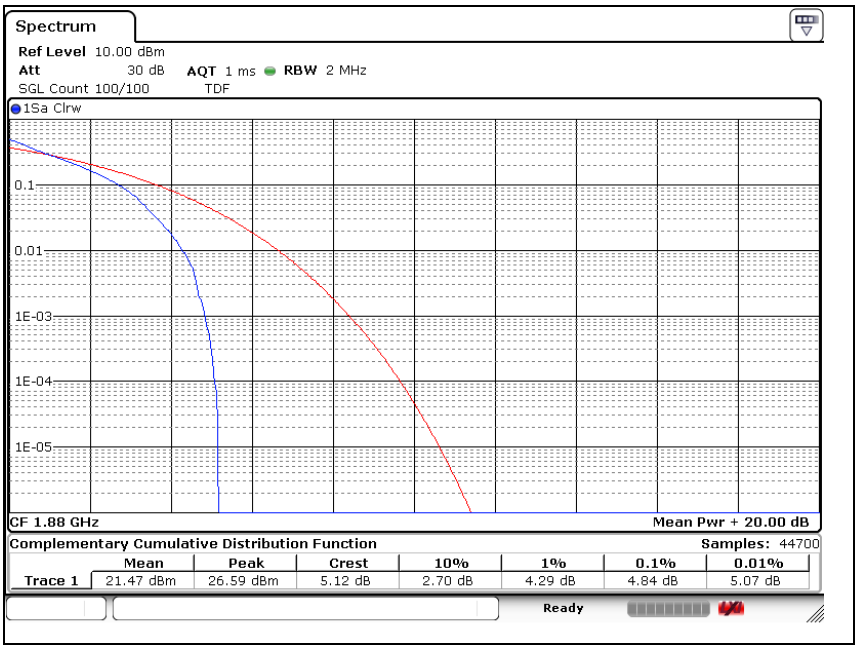
LTE band 2 (1.4 ㎒ - QPSK)

Low Channel



Middle Channel



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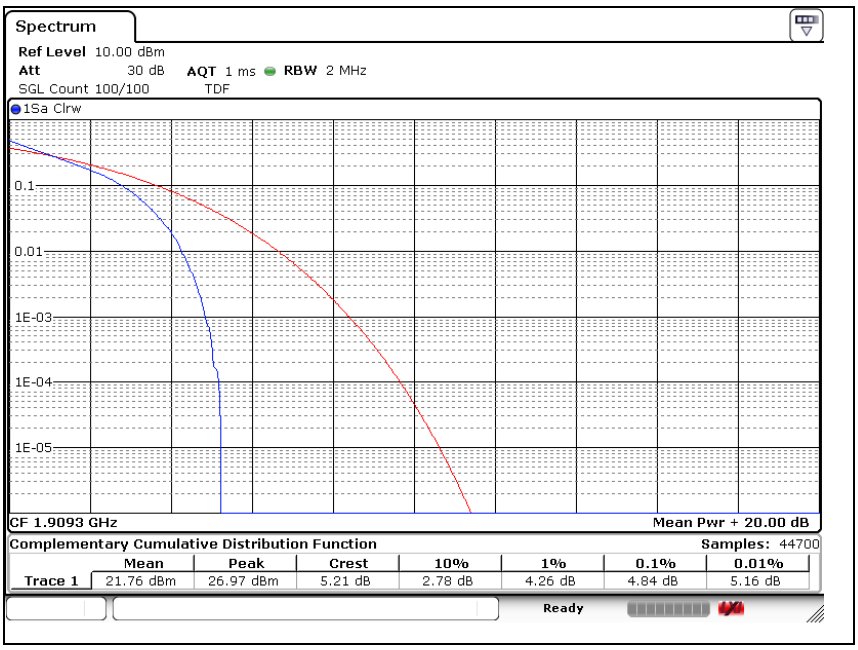
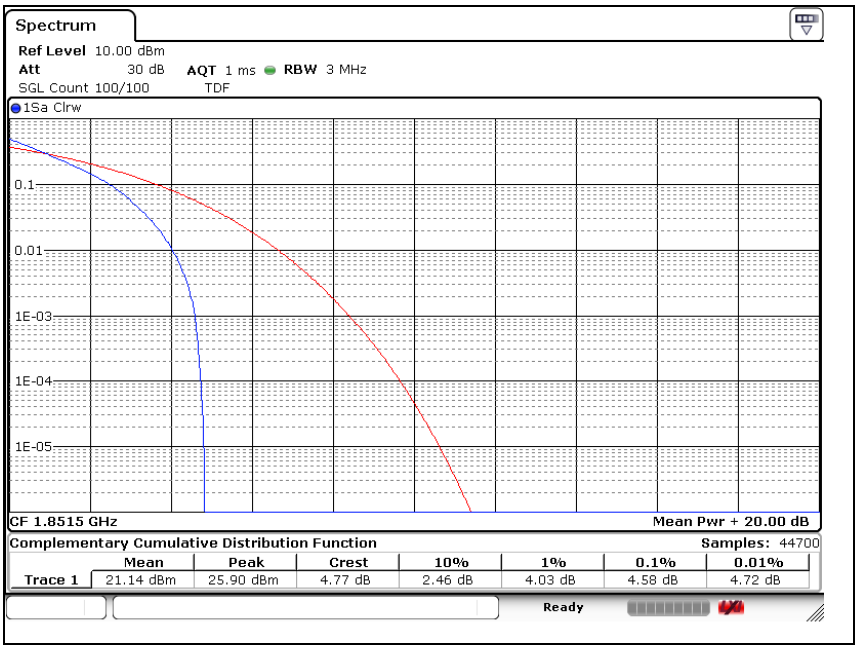
High Channel



LTE band 2 (3 ㎒ - QPSK)

Low Channel



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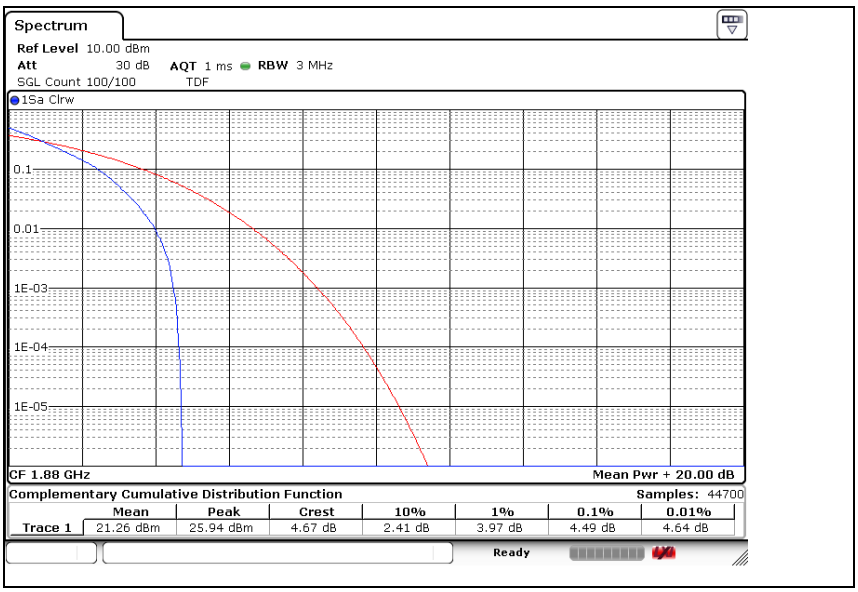
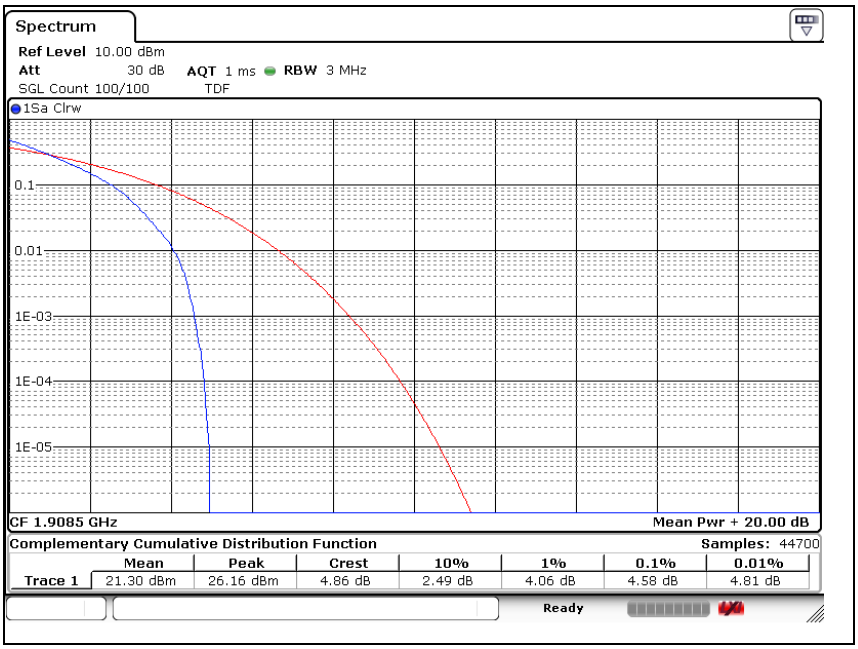
Middle Channel



High Channel



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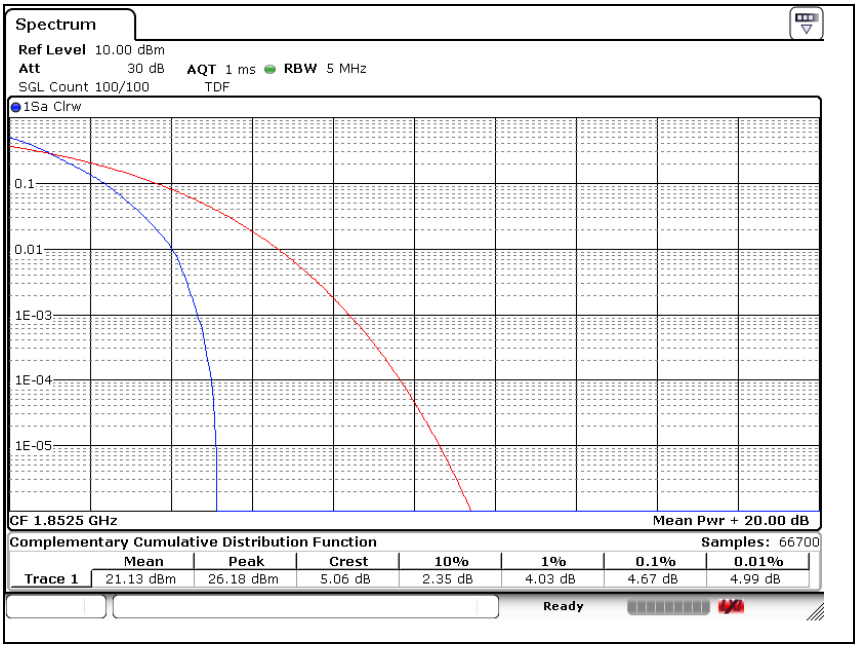
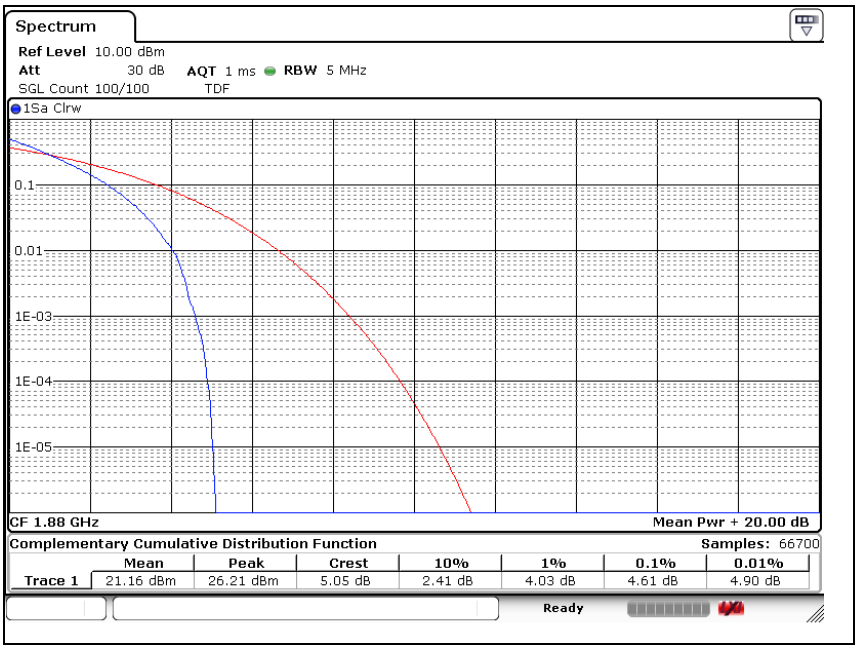
LTE band 2 (5 ㎒ - QPSK)

Low Channel



Middle Channel



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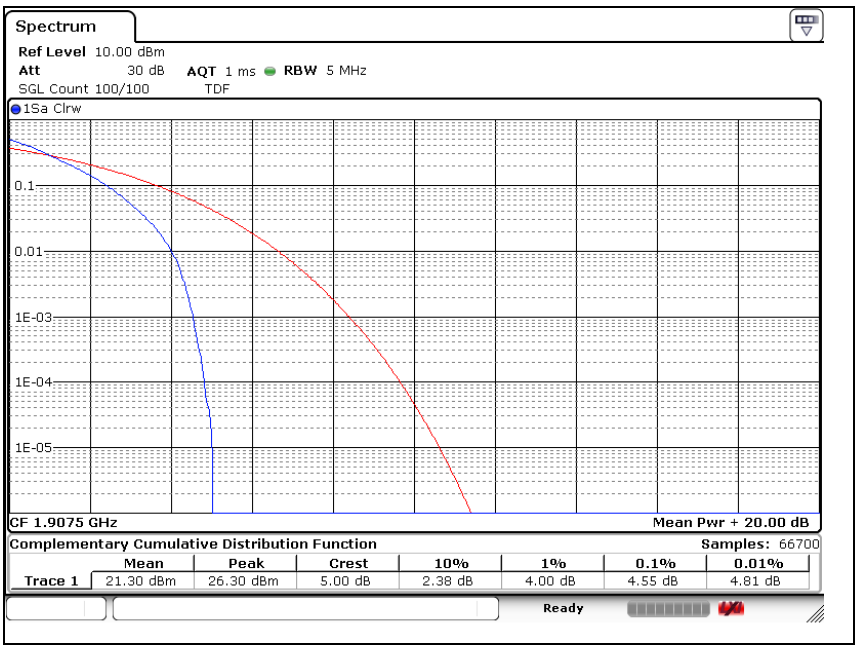
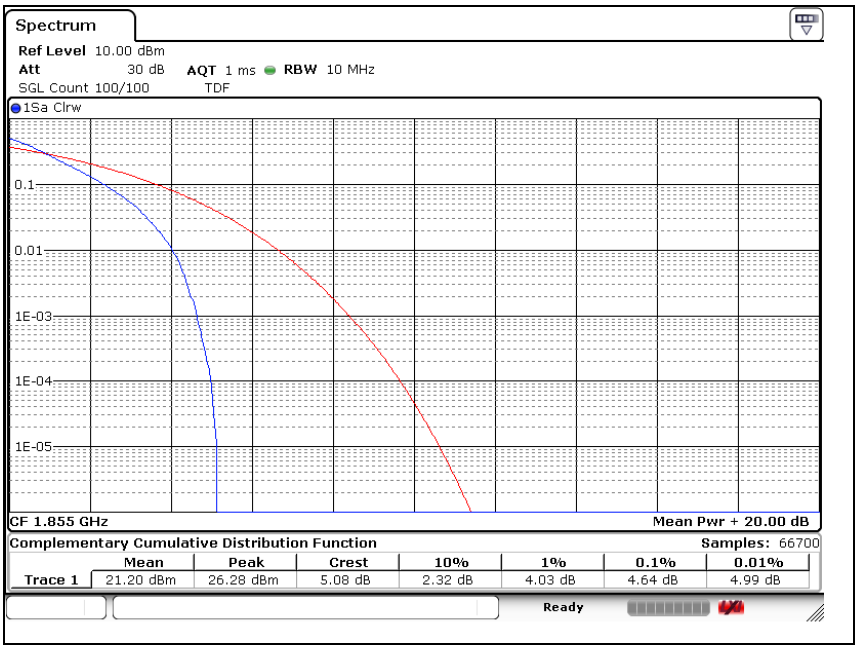
High Channel



LTE band 2 (10 ㎒ - QPSK)

Low Channel



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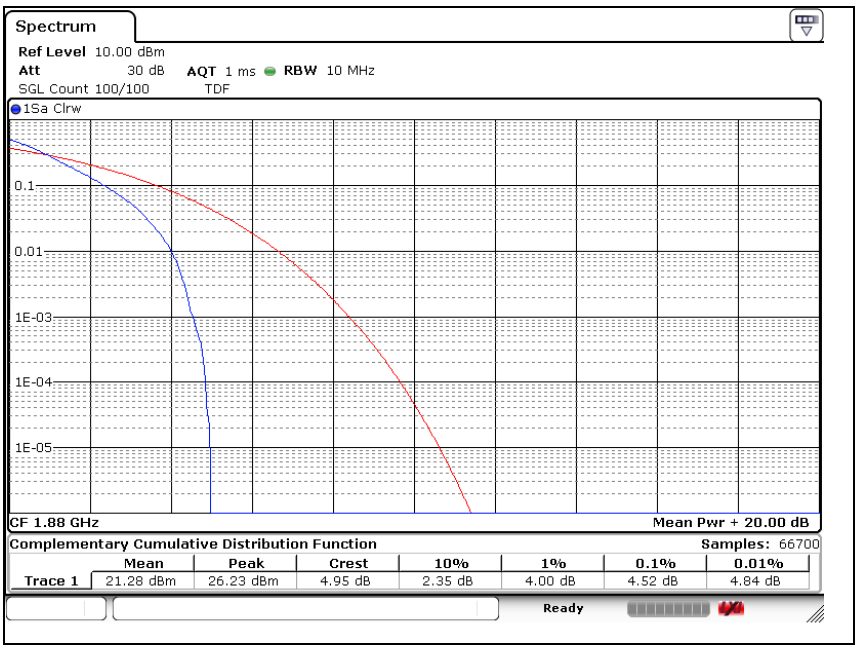
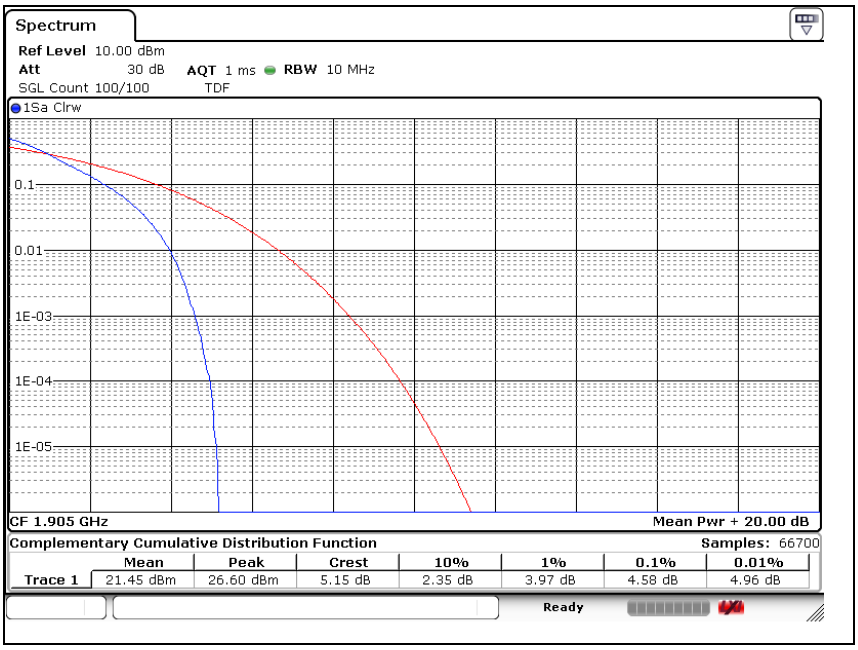
Middle Channel



High Channel



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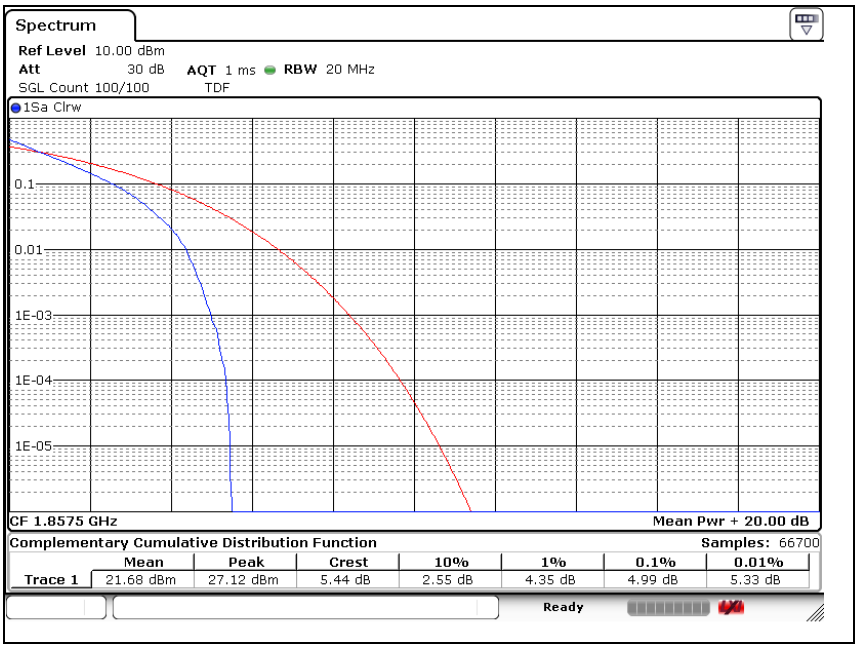
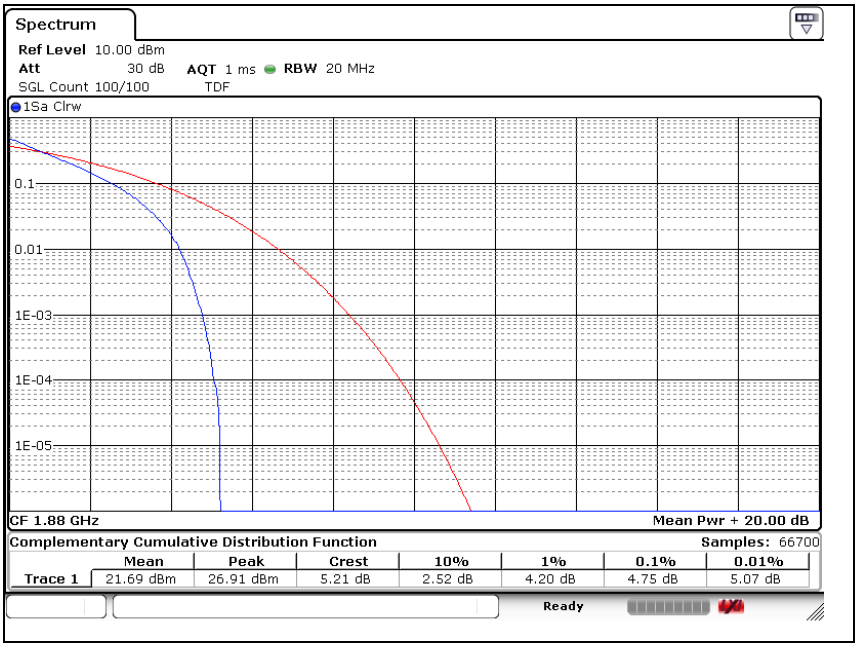
LTE band 2 (15 ㎒ - QPSK)

Low Channel



Middle Channel



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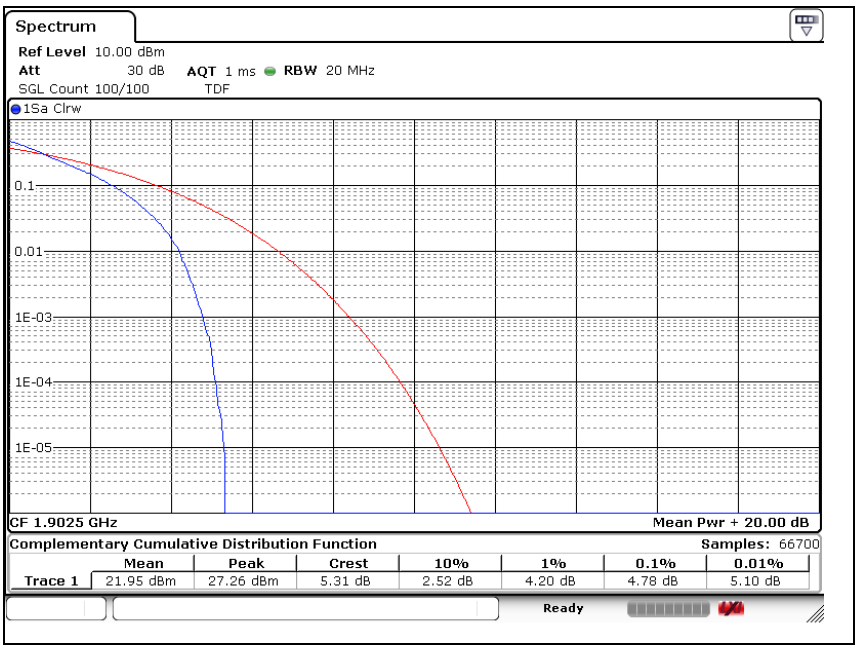
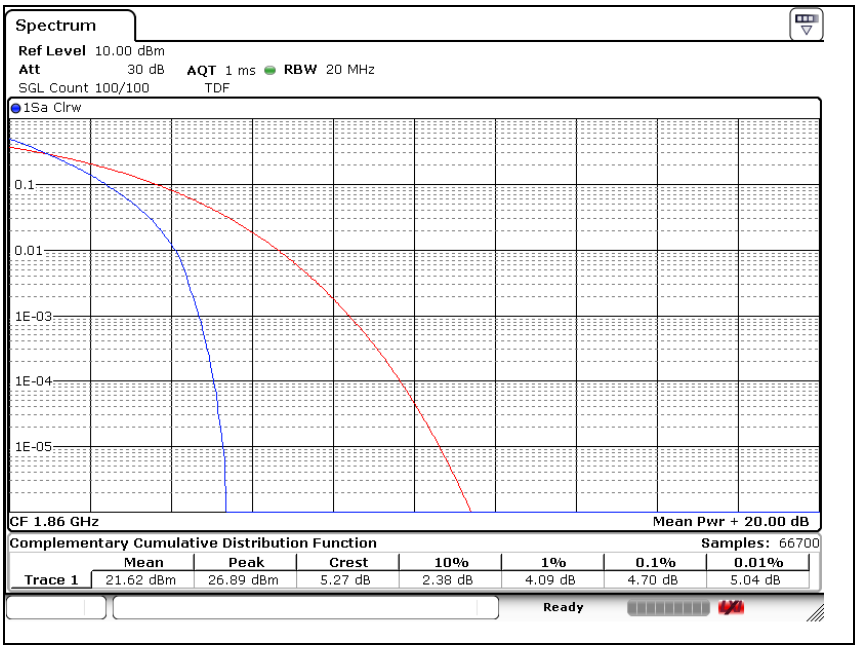
High Channel



LTE band 2 (20 ㎒ - QPSK)

Low Channel



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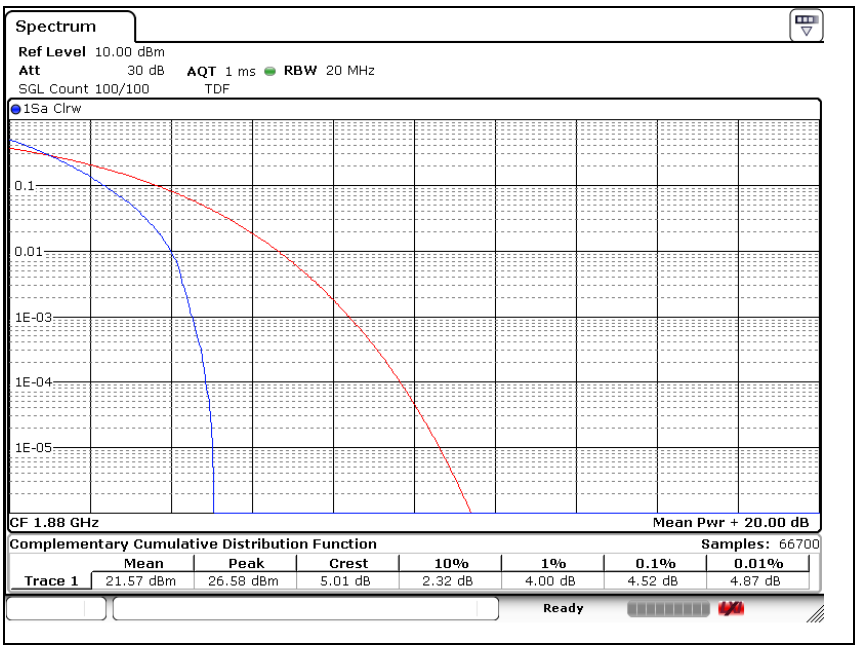
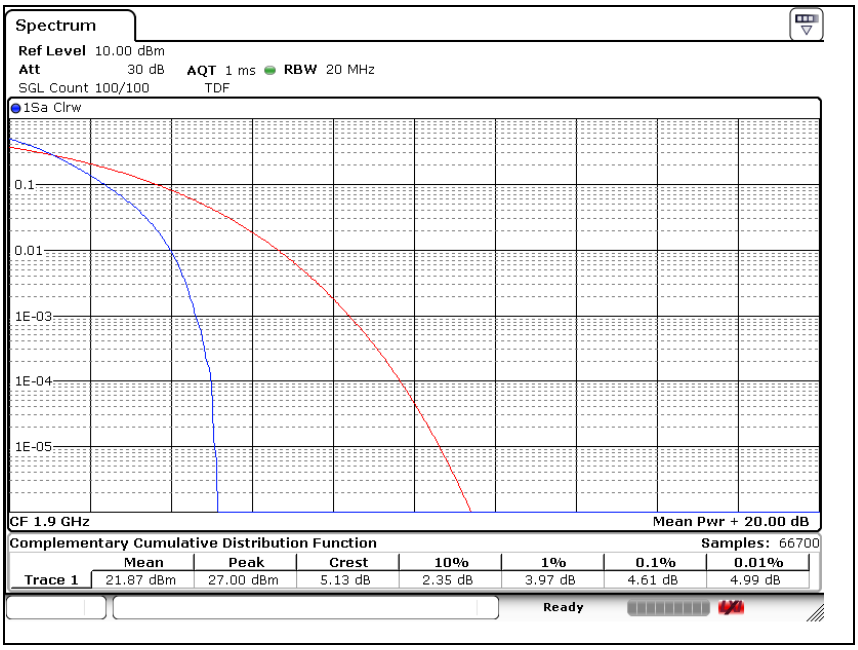
Middle Channel



High Channel



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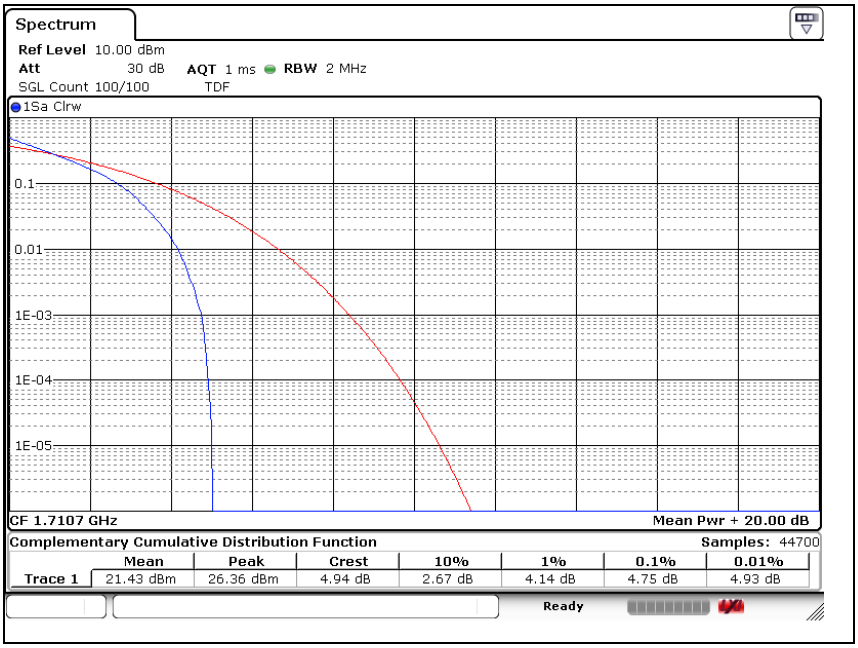
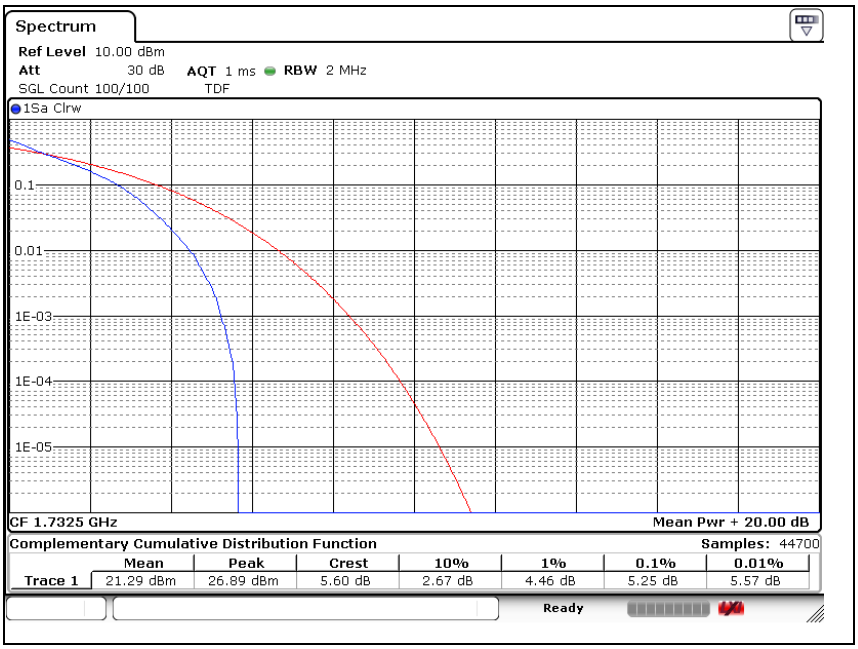
LTE band 4 (1.4 ㎒ - QPSK)

Low Channel



Middle Channel



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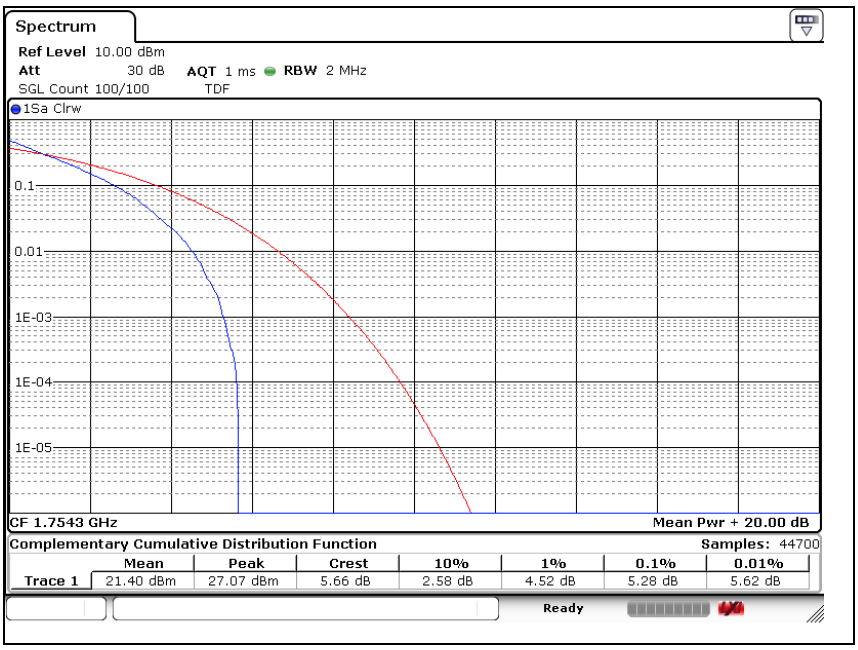
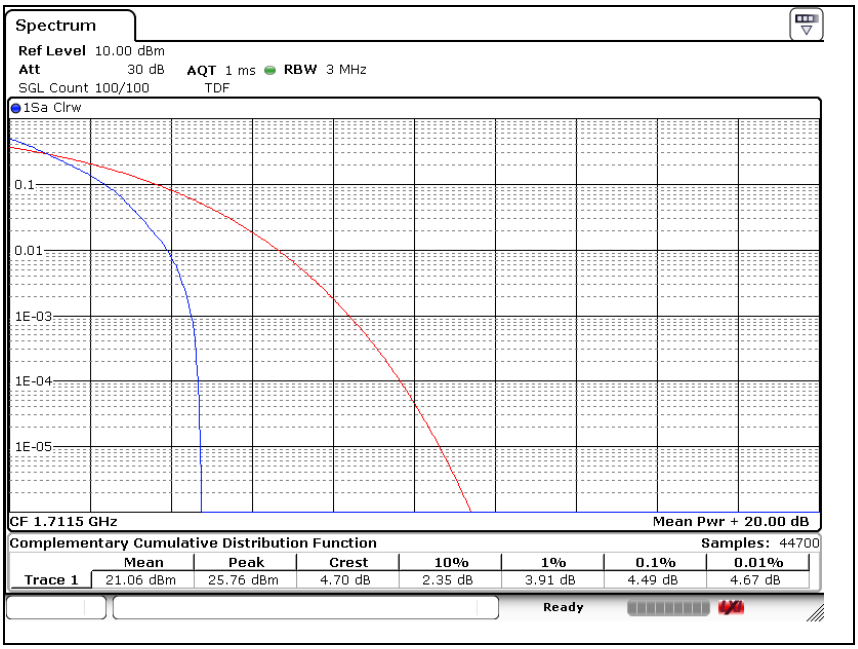
High Channel



LTE band 4 (3 ㎒ - QPSK)

Low Channel



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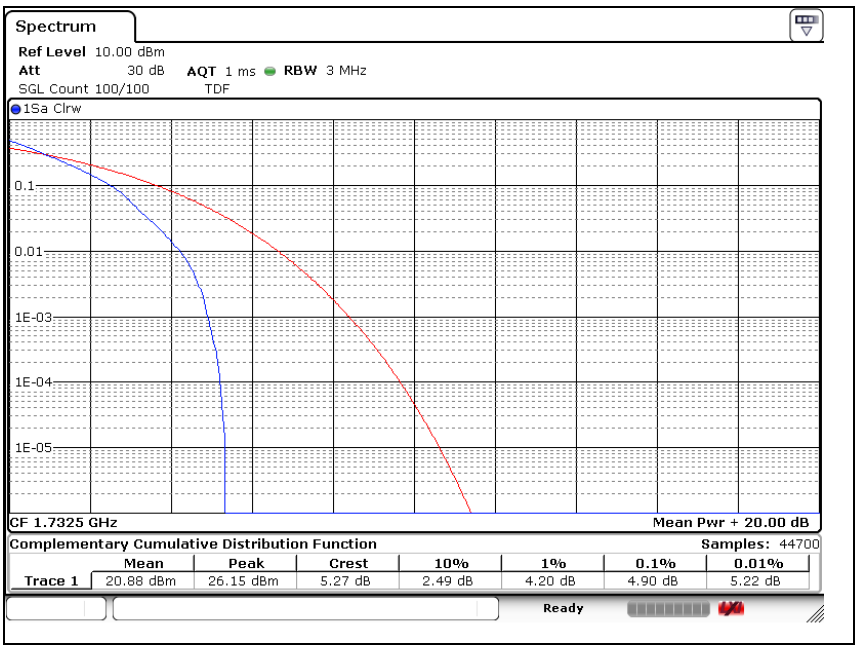
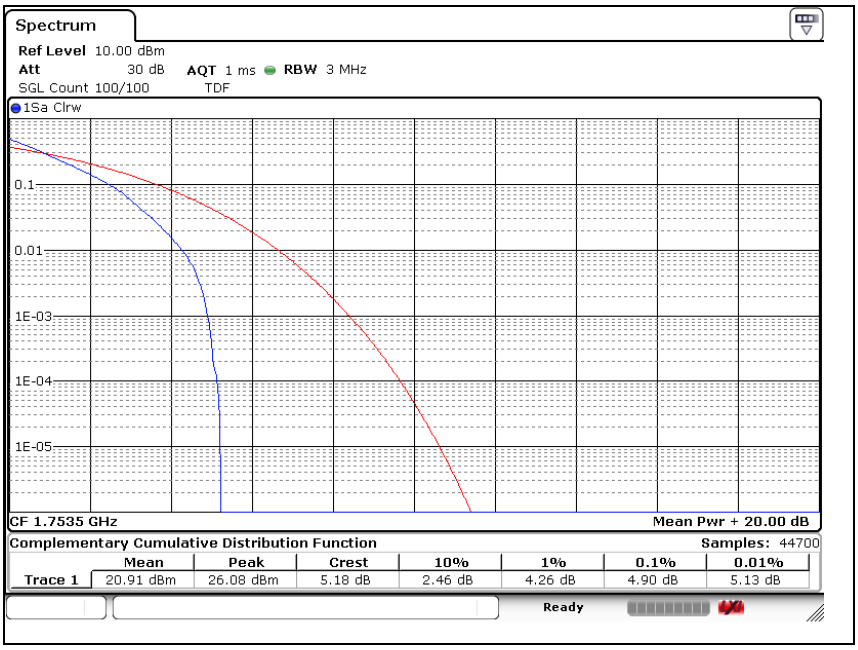
Middle Channel



High Channel



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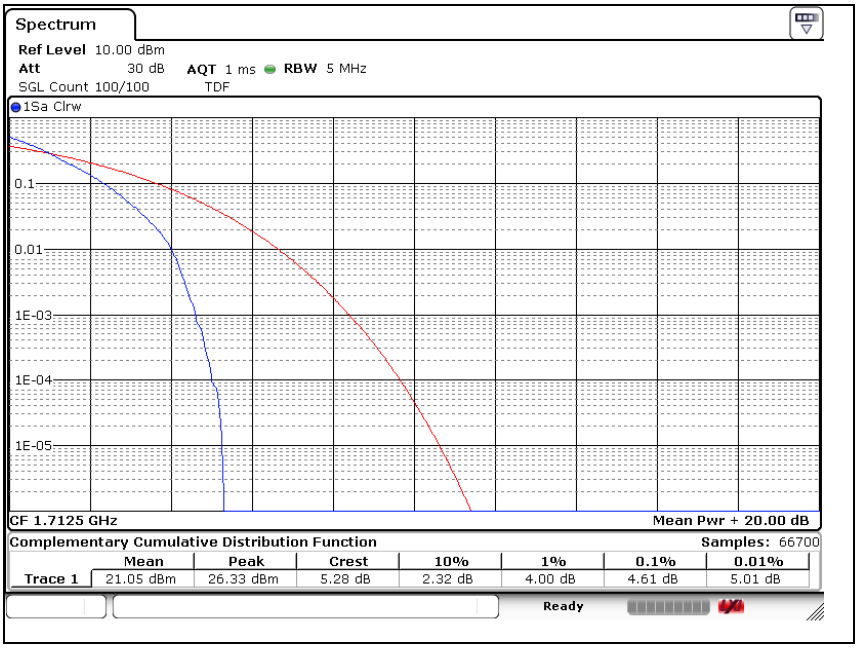
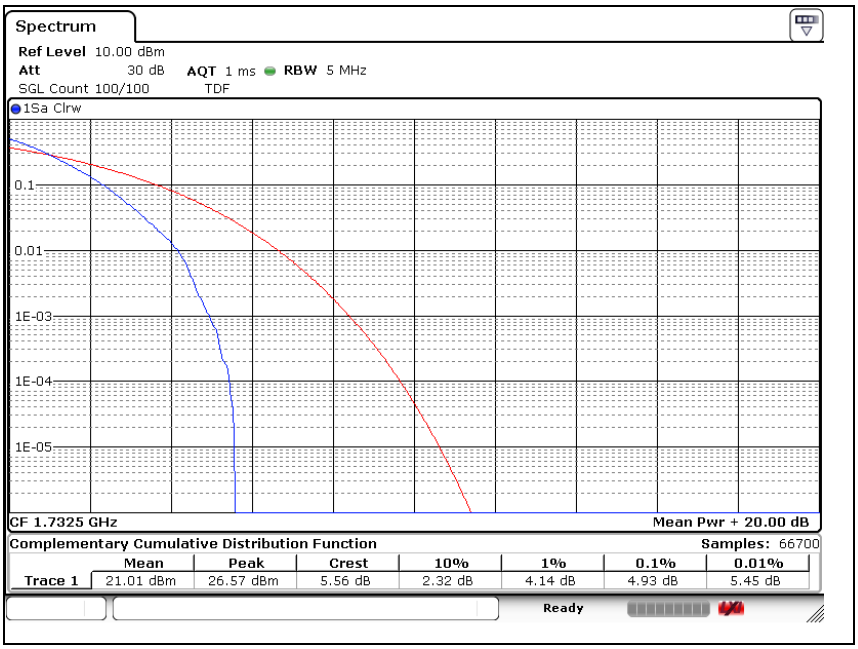
LTE band 4 (5 ㎒ - QPSK)

Low Channel



Middle Channel



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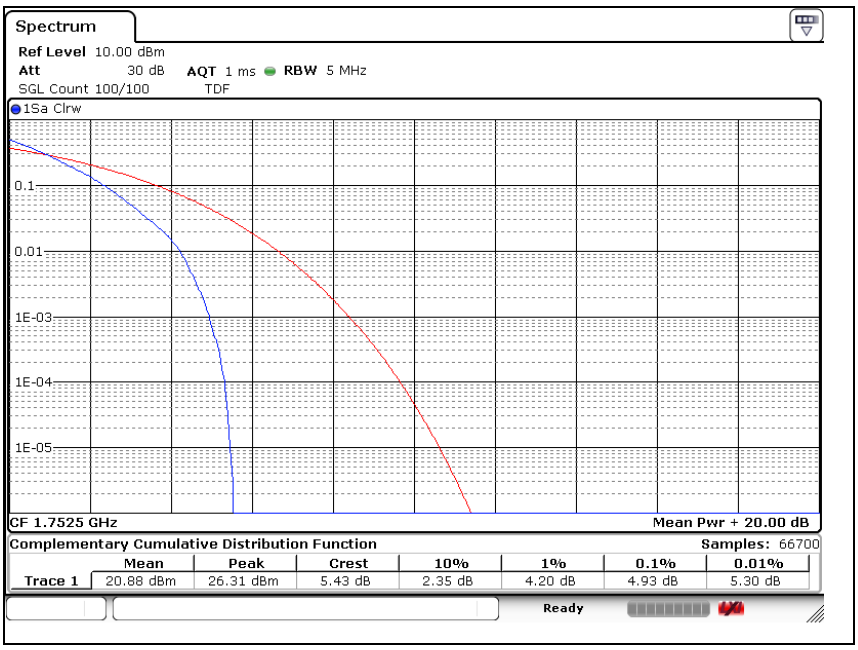
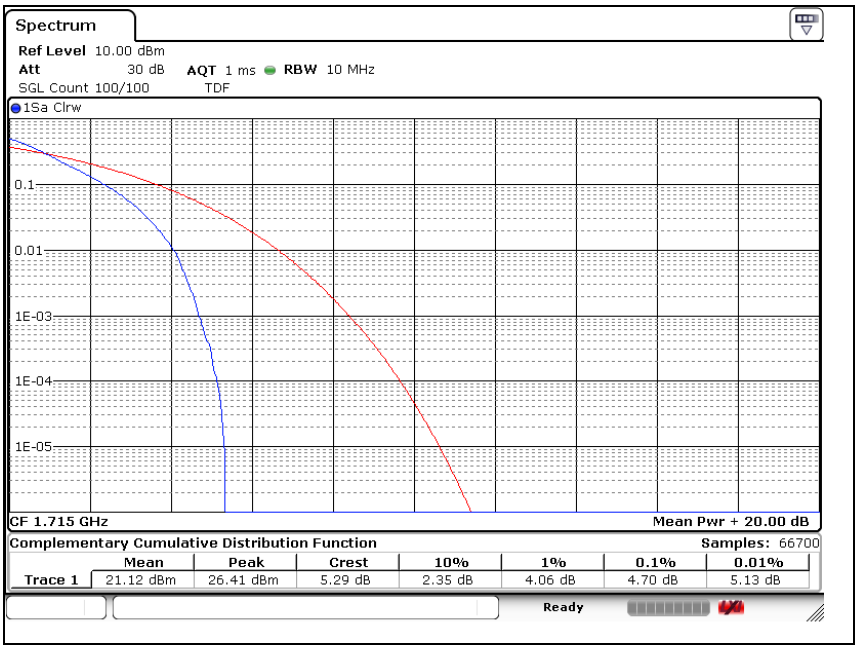
High Channel



LTE band 4 (10 ㎒ - QPSK)

Low Channel



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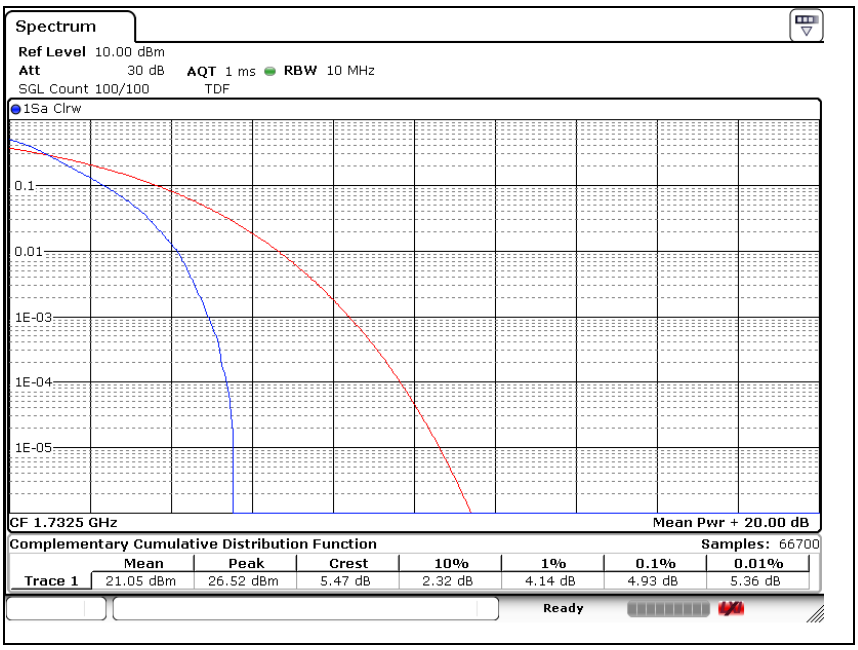
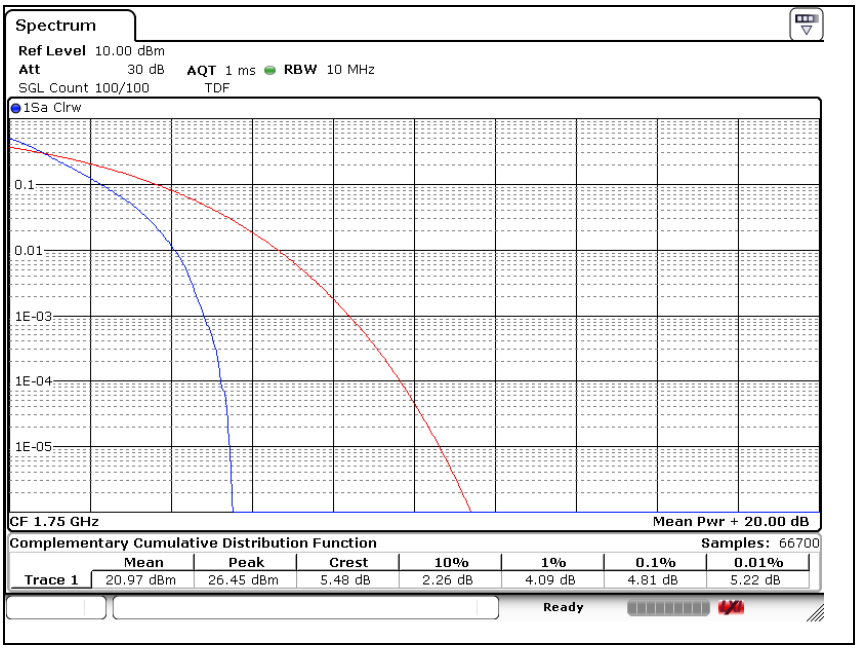
Middle Channel



High Channel



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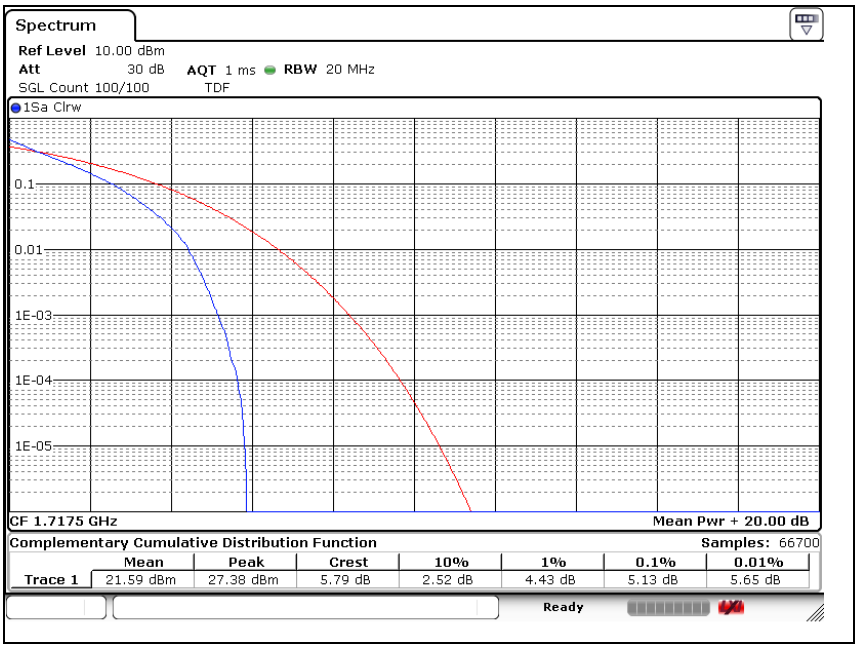
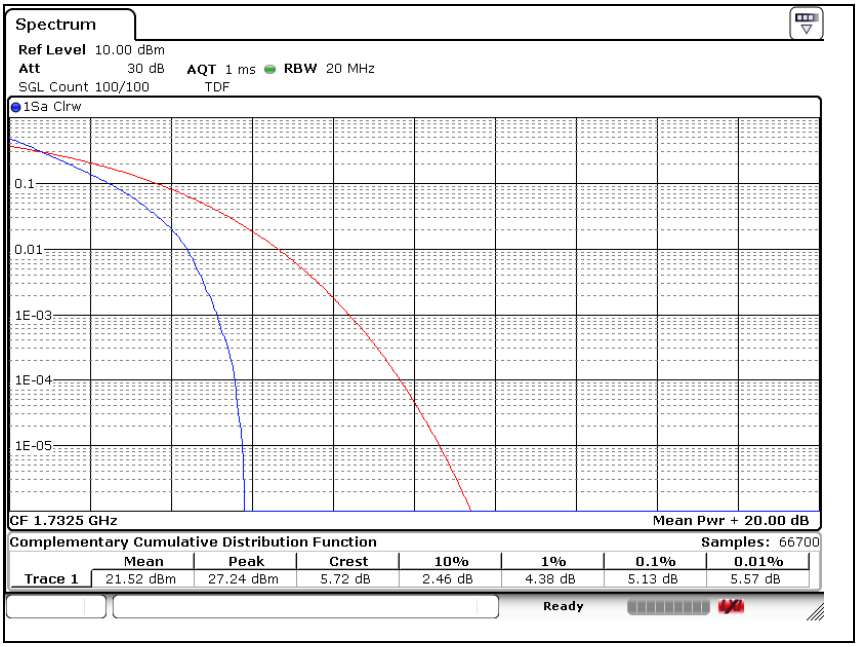
LTE band 4 (15 ㎒ - QPSK)

Low Channel



Middle Channel



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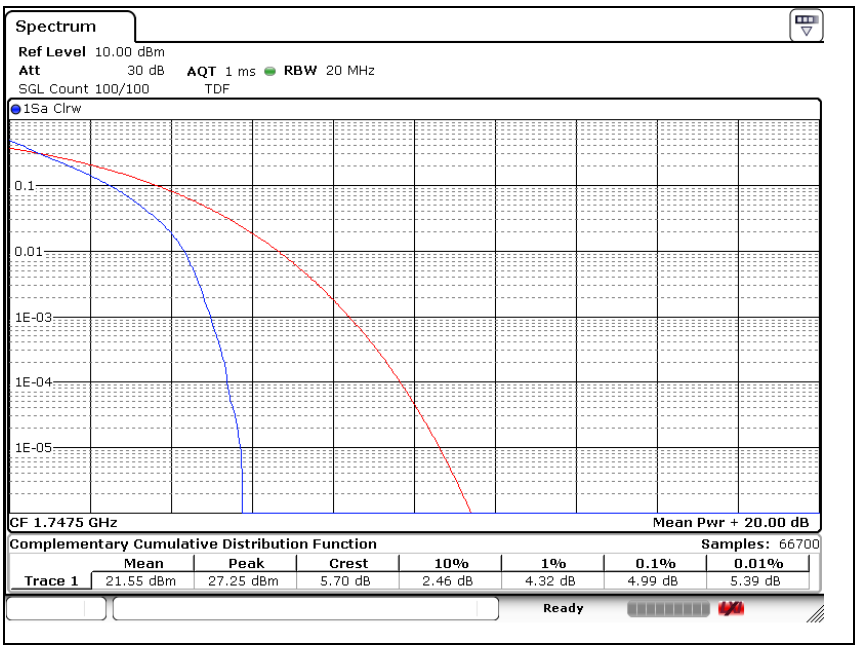
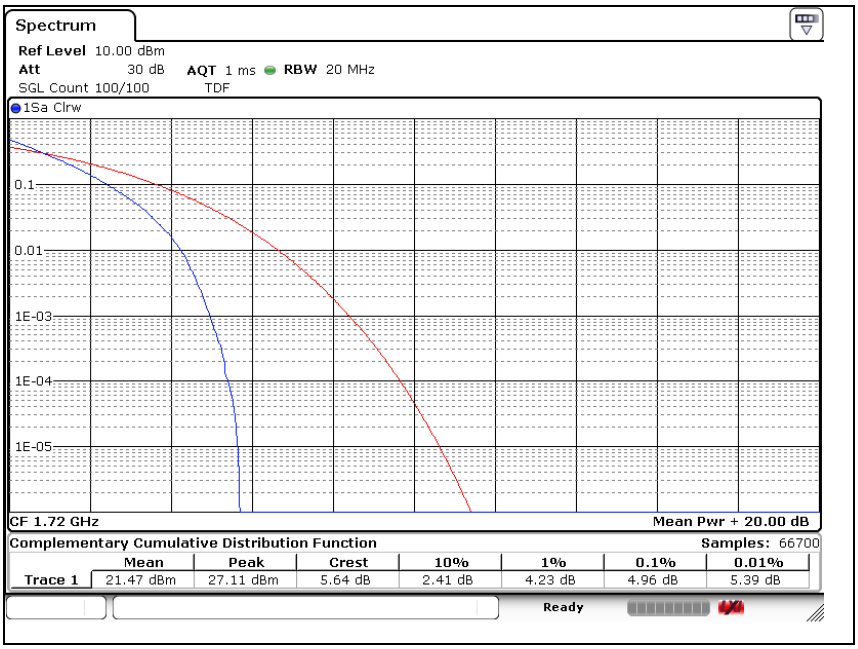
High Channel



LTE band 4 (20 ㎒ - QPSK)

Low Channel



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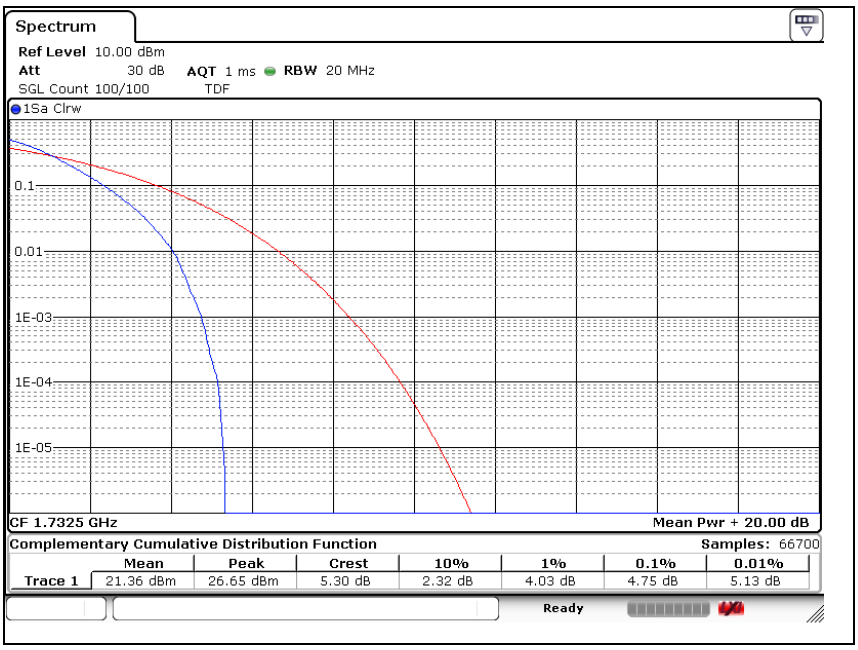
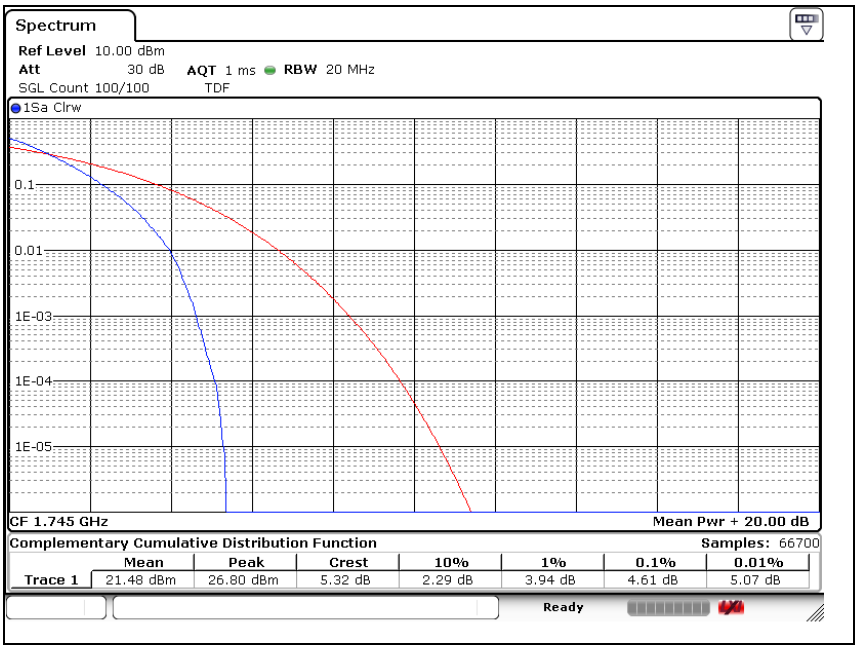
Middle Channel



High Channel



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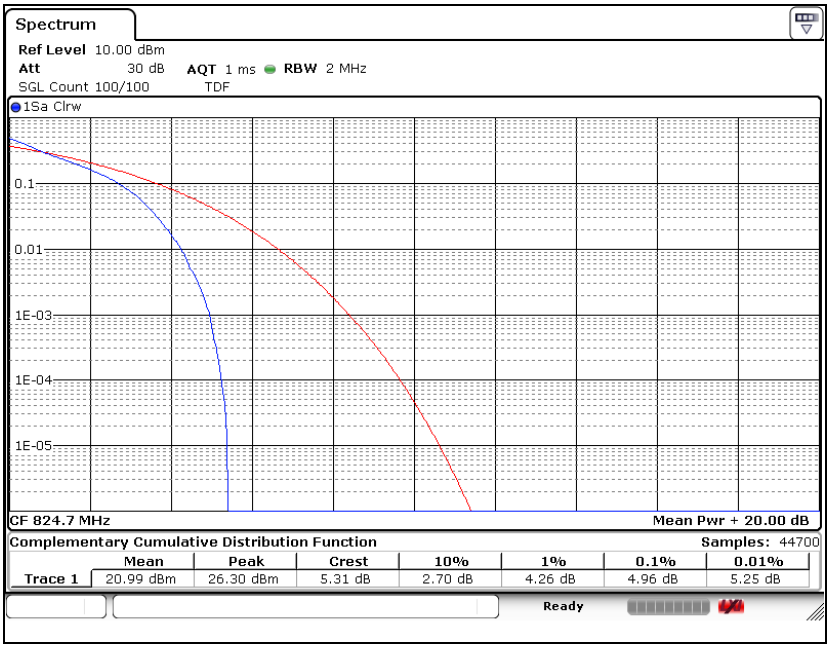
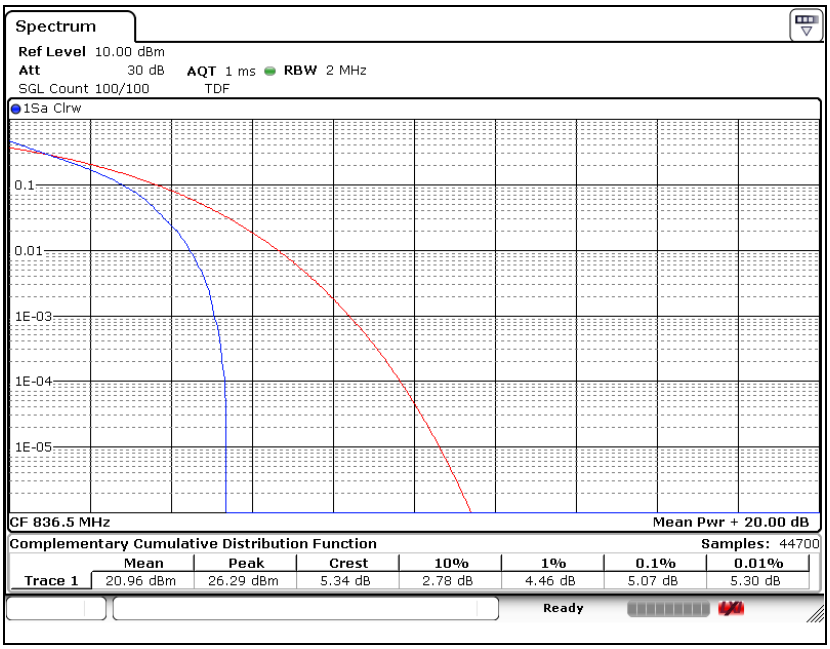
LTE band 5 (1.4 ㎒ - QPSK)

Low Channel



Middle Channel



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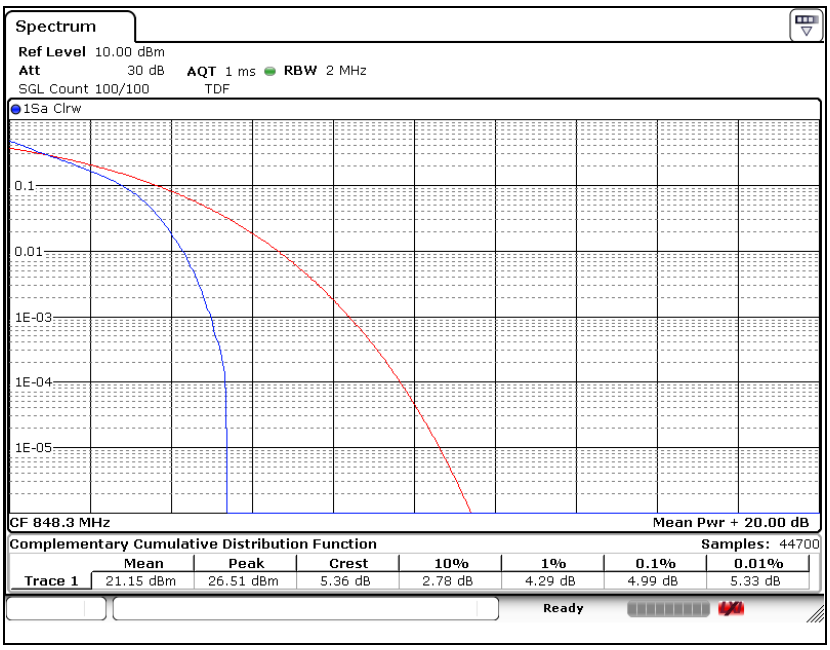
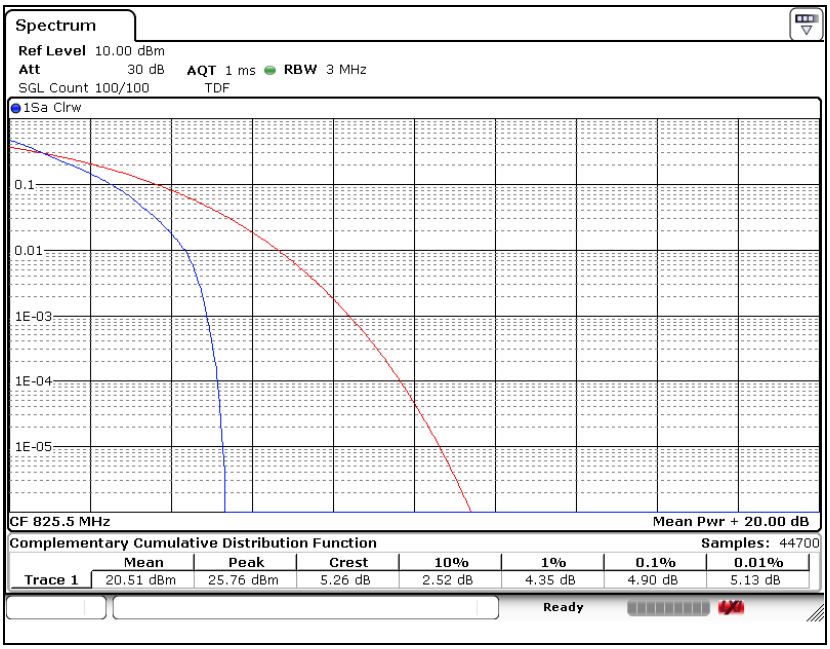
High Channel



LTE band 5 (3 ㎒ - QPSK)

Low Channel



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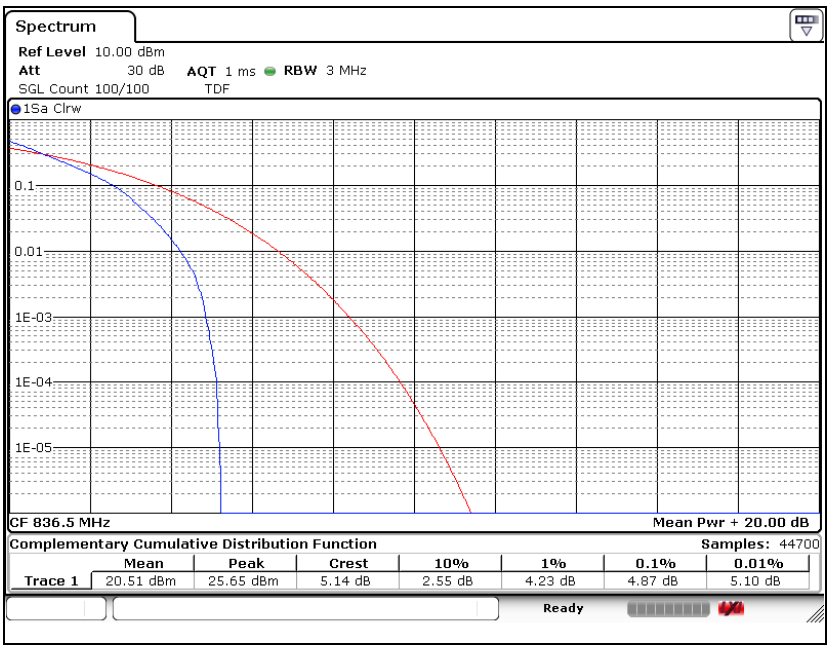
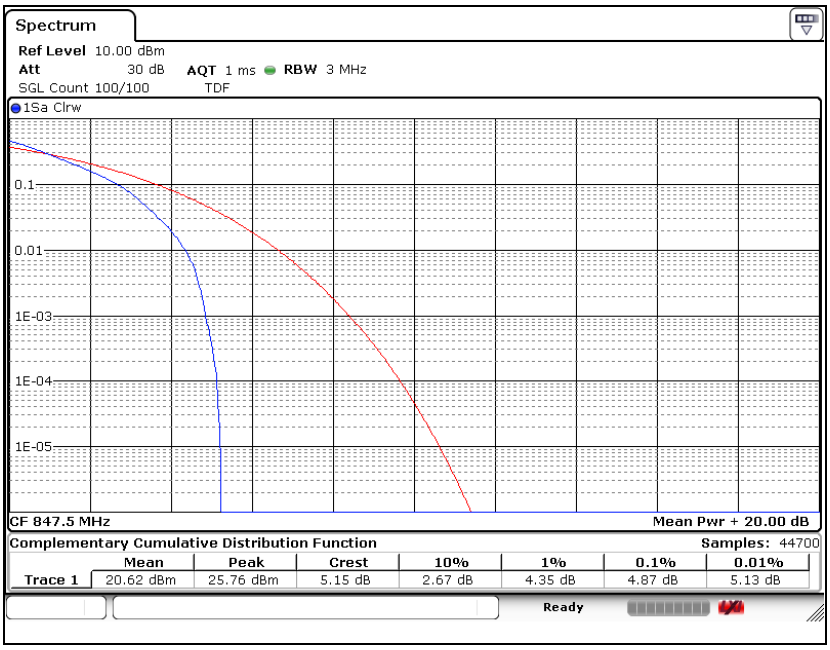
Middle Channel



High Channel



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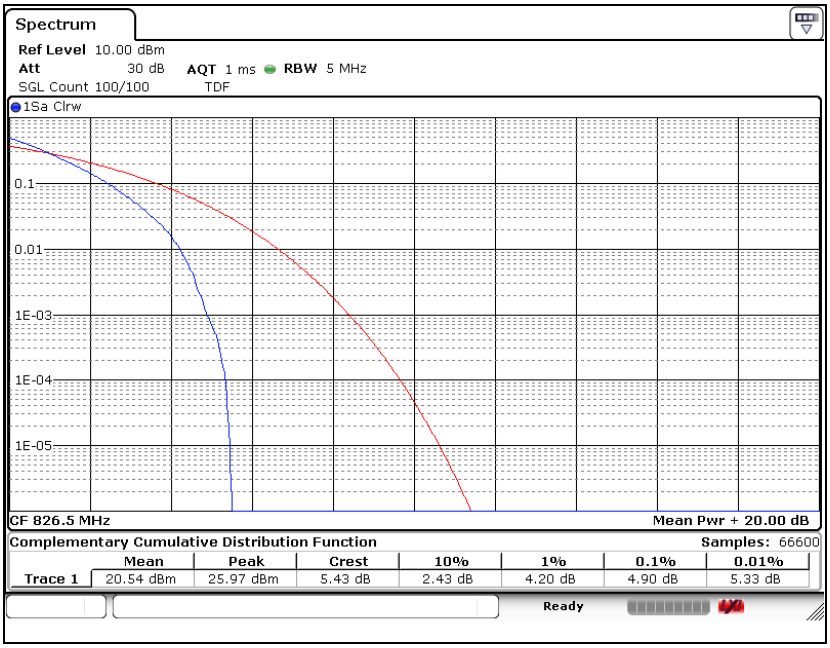
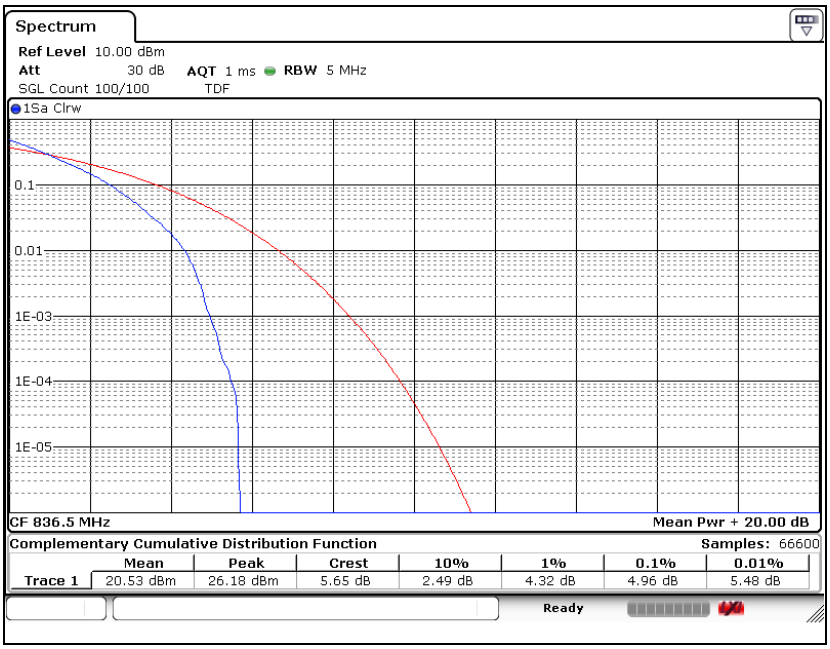
LTE band 5 (5 ㎒ - QPSK)

Low Channel



Middle Channel



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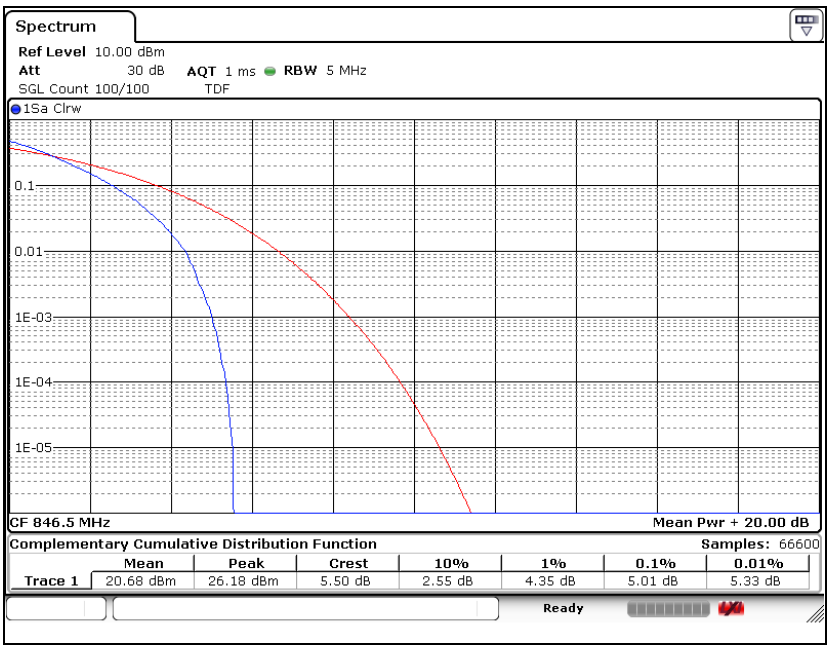
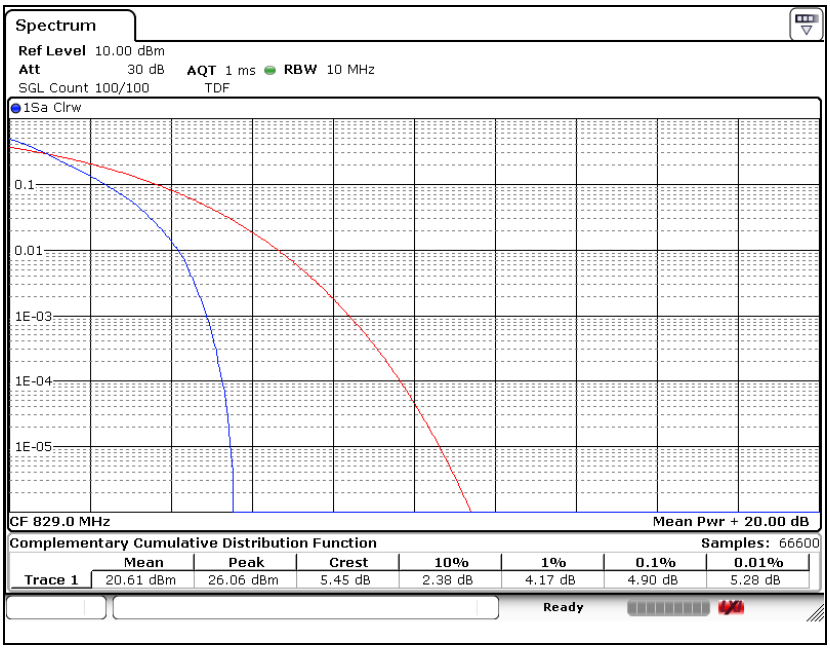
High Channel



LTE band 5 (10 ㎒ - QPSK)

Low Channel



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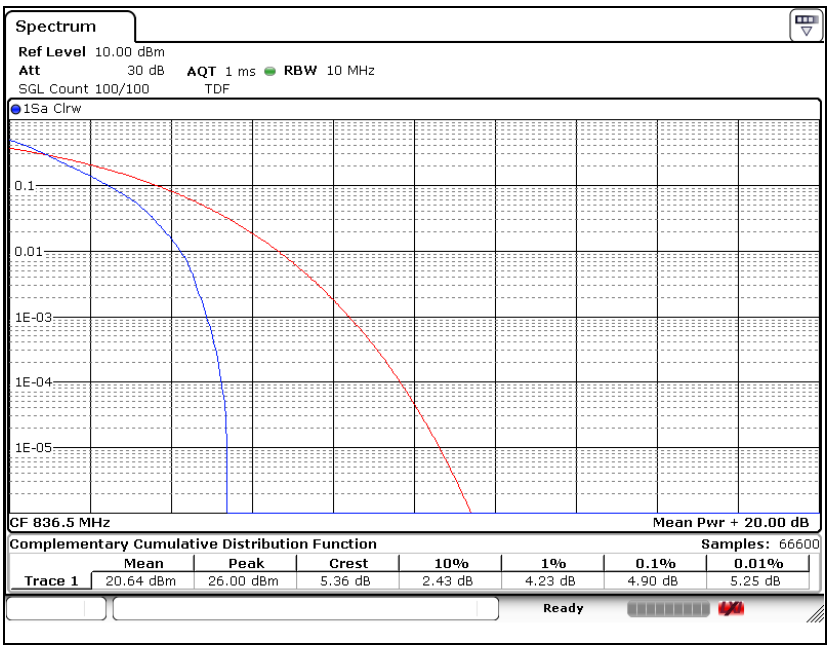
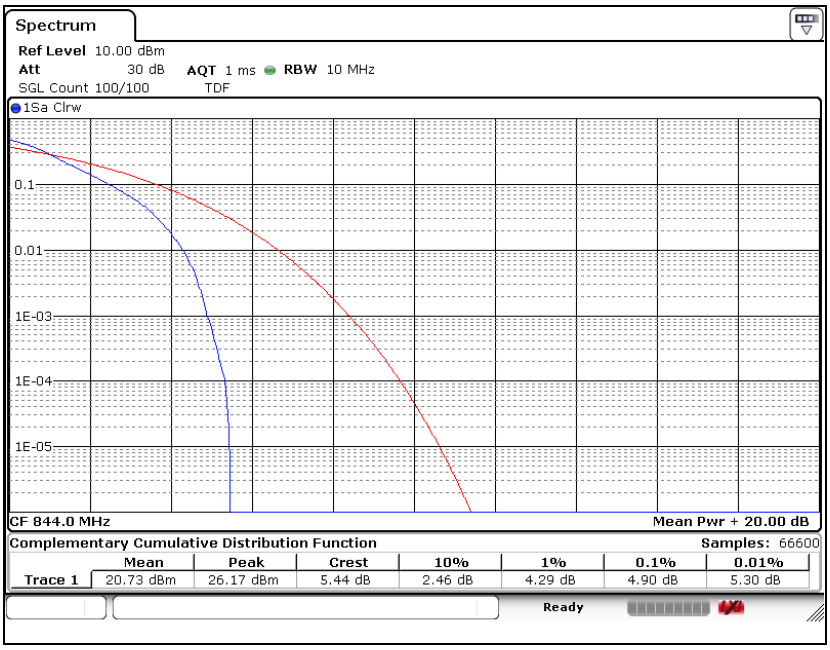
Middle Channel



High Channel



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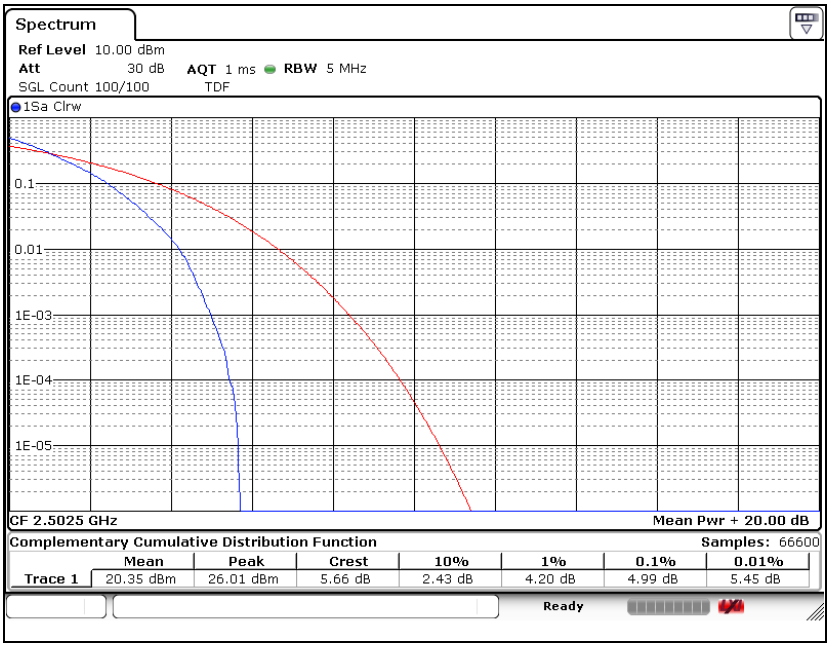
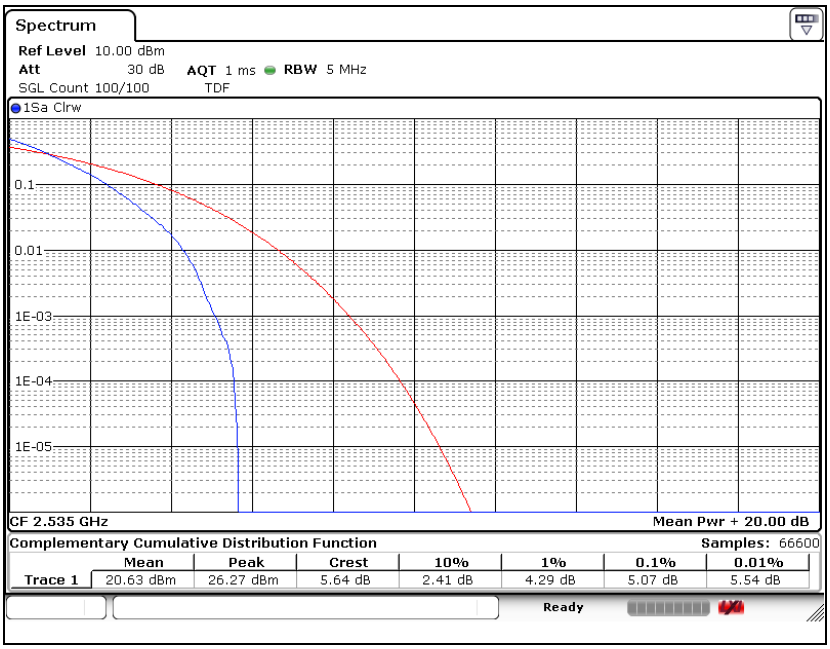
LTE band 7 (5 ㎒ - QPSK)

Low Channel



Middle Channel



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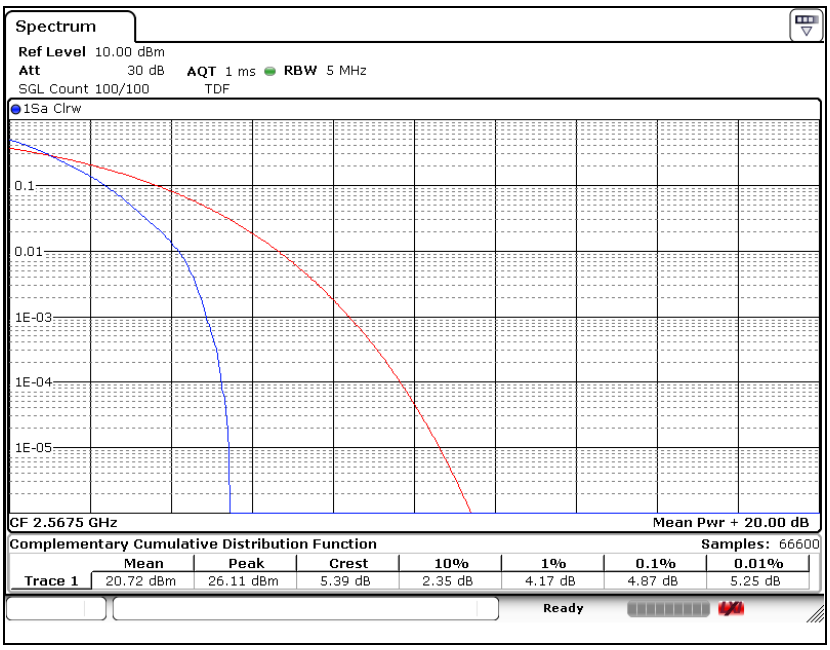
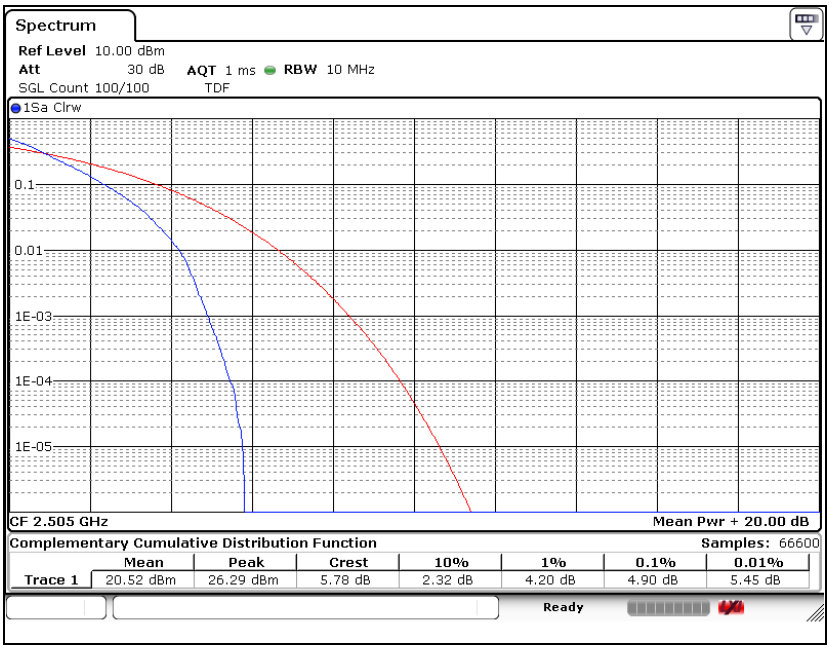
High Channel



LTE band 7 (10 ㎒ - QPSK)

Low Channel



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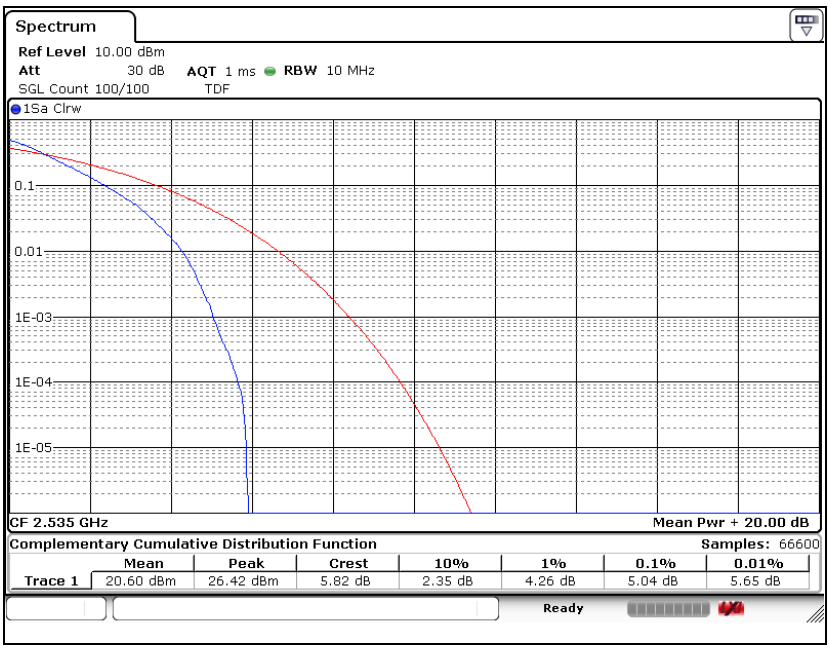
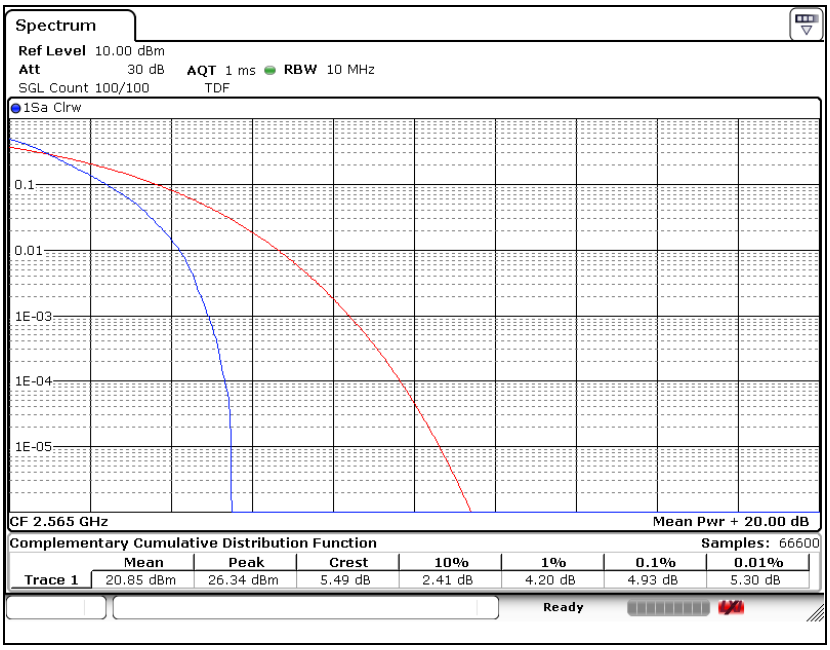
Middle Channel



High Channel



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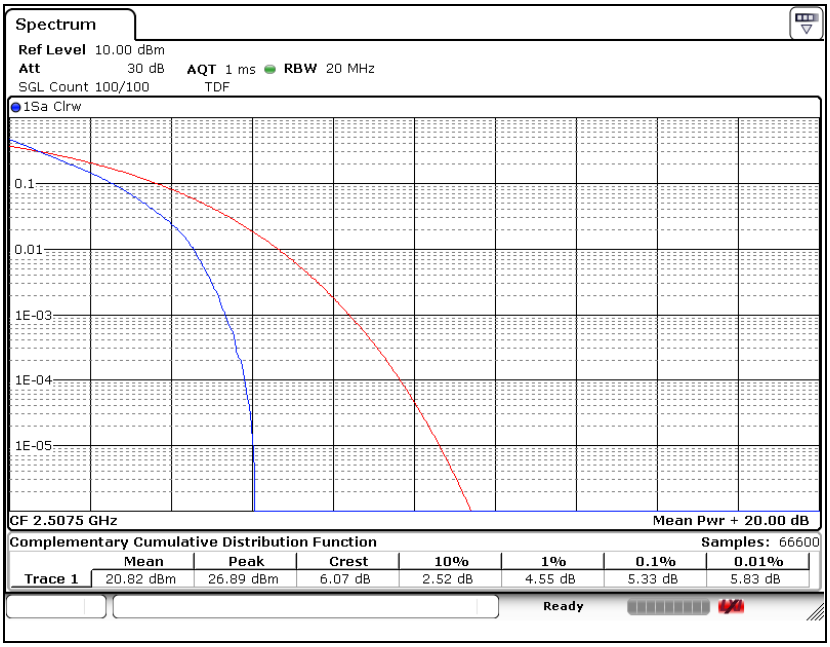
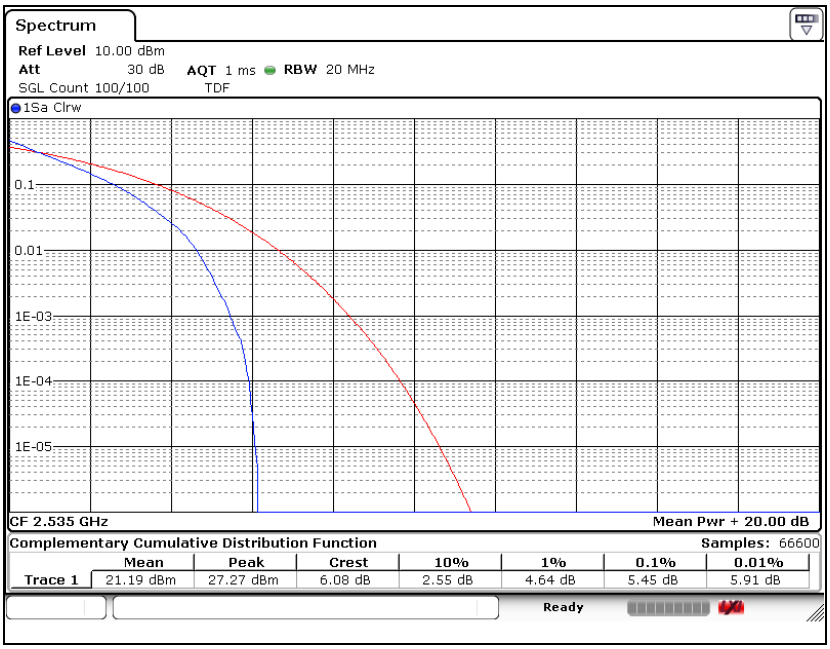
LTE band 7 (15 ㎒ - QPSK)

Low Channel



Middle Channel



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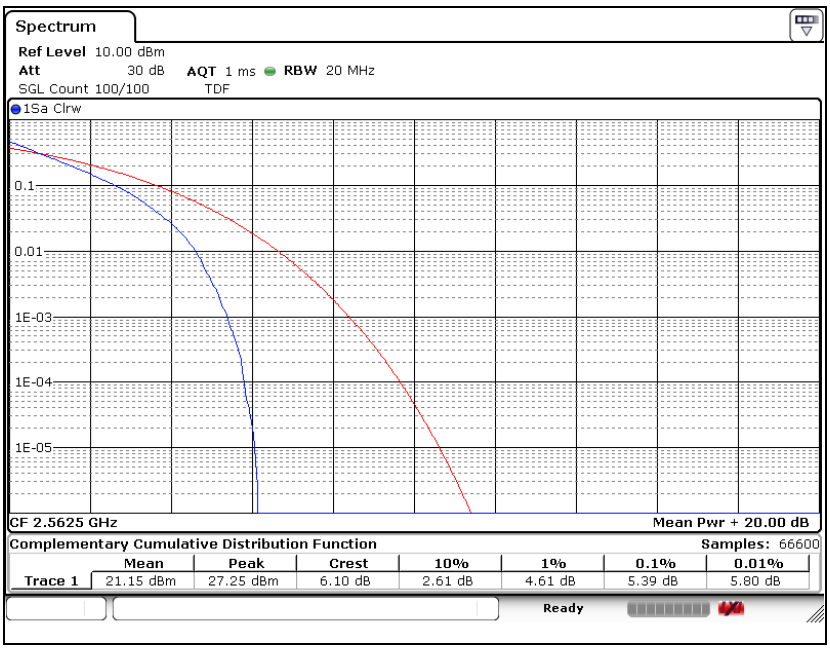
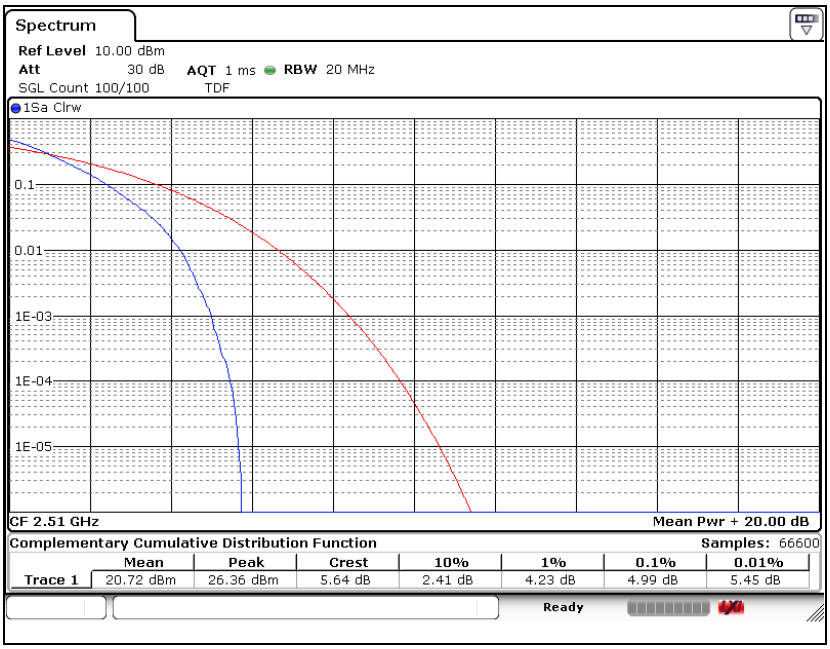
High Channel



LTE band 7 (20 ㎒ - QPSK)

Low Channel



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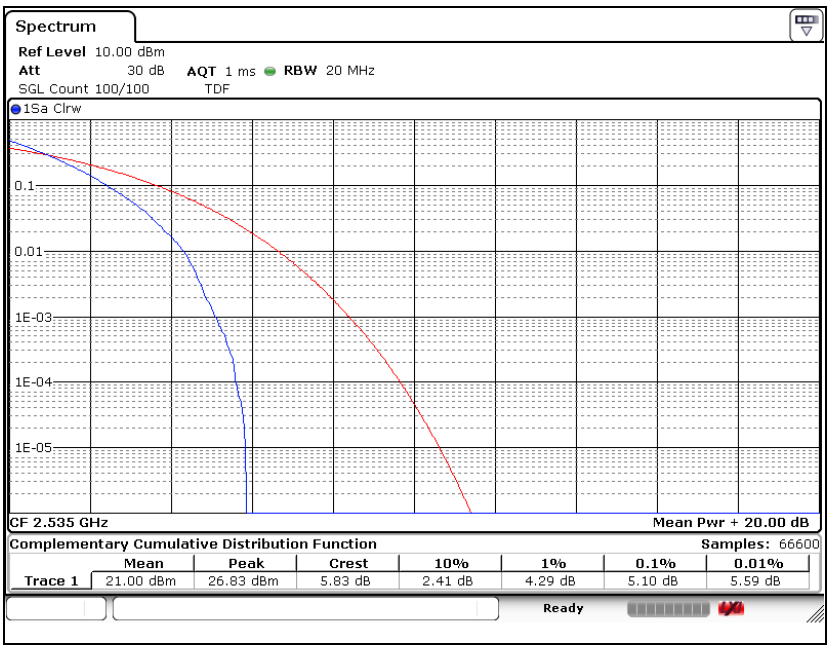
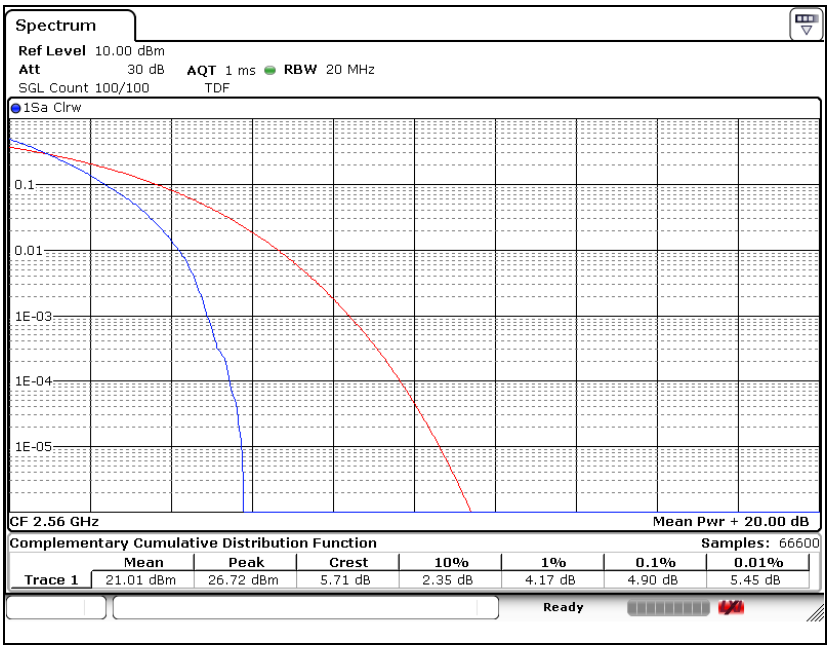
Middle Channel



High Channel



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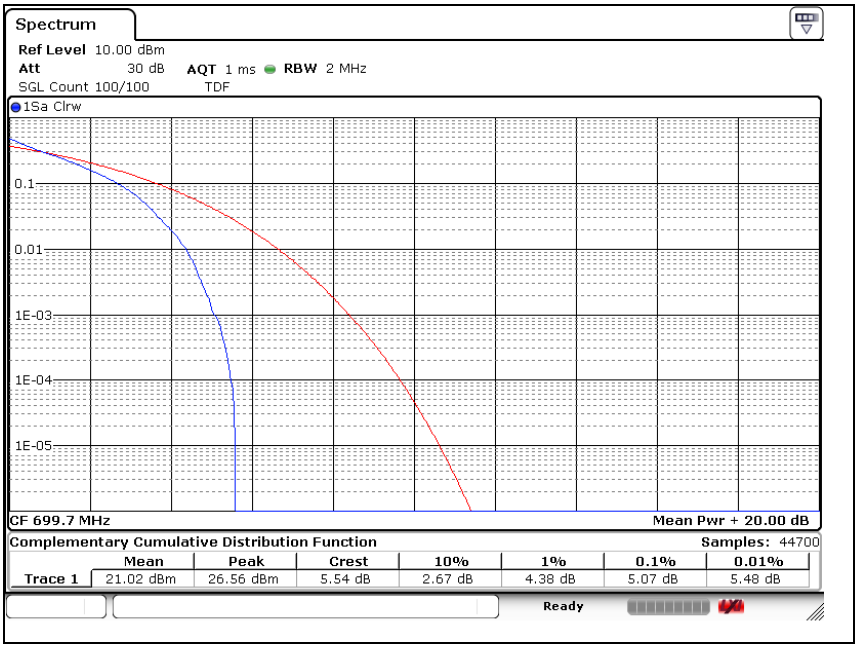
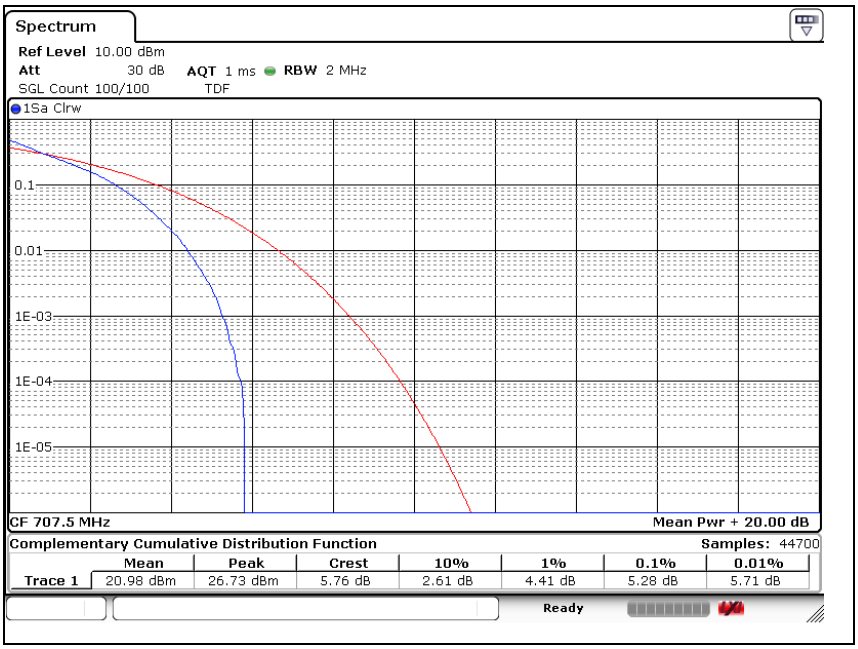
LTE band 12 (1.4 ㎒ - QPSK)

Low Channel



Middle Channel



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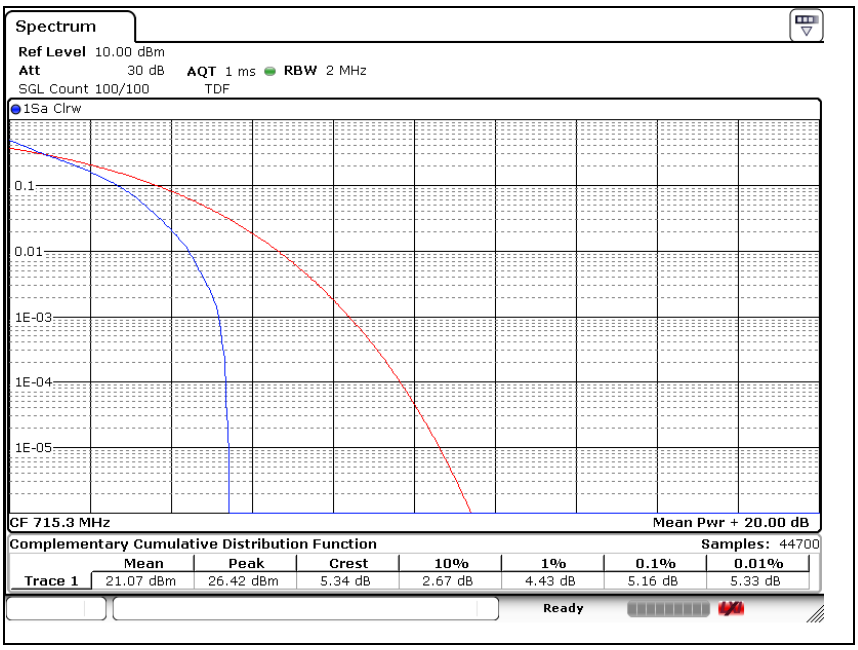
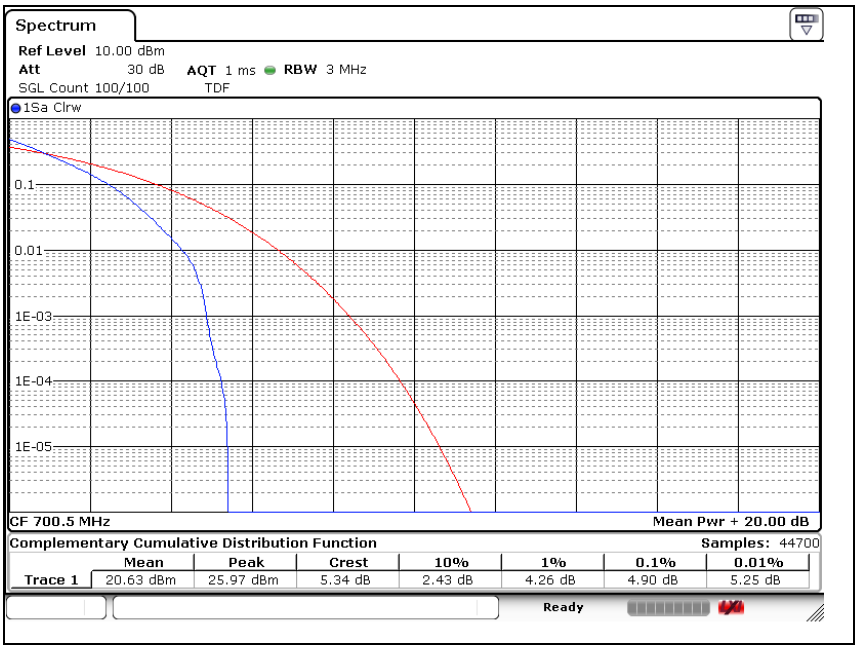
High Channel



LTE band 12 (3 ㎒ - QPSK)

Low Channel



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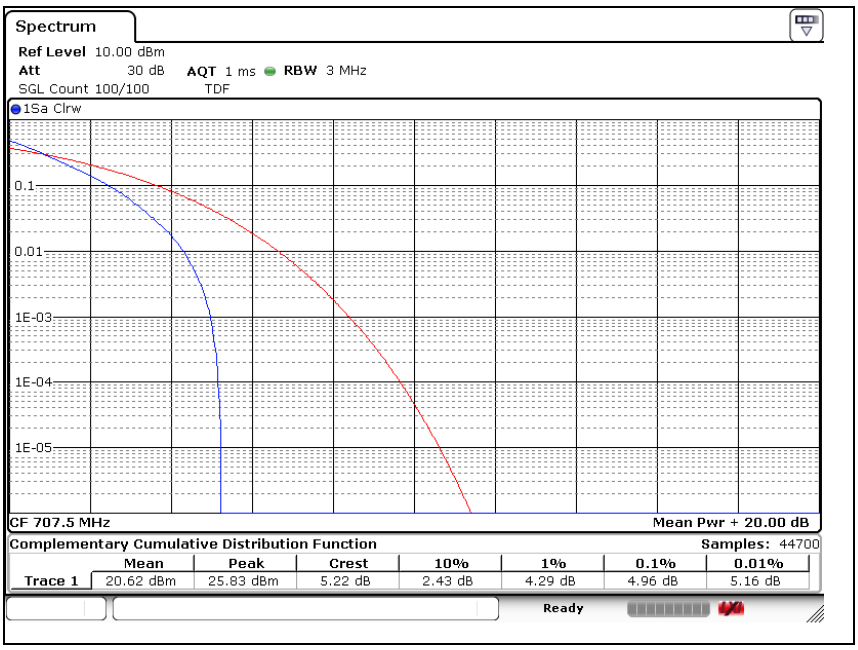
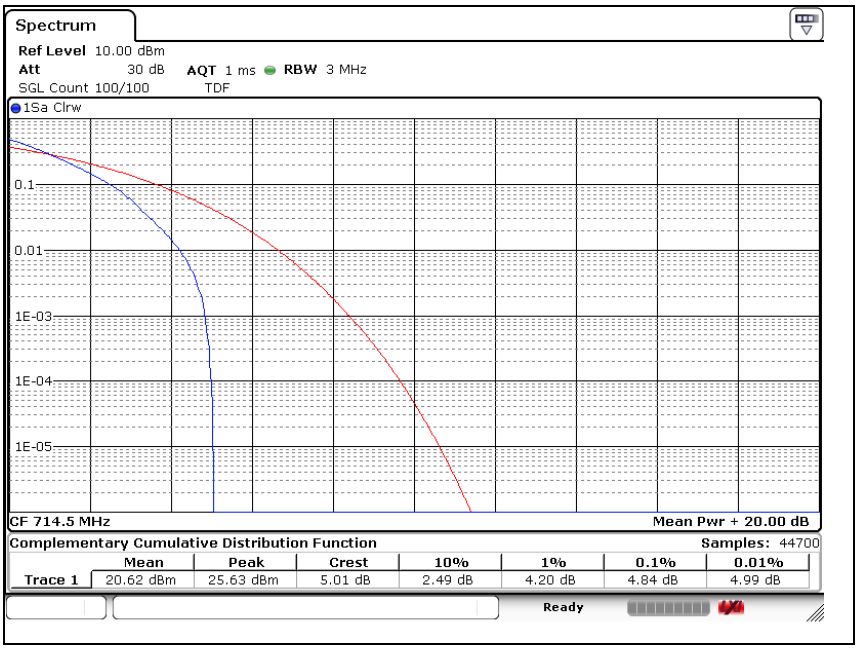
Middle Channel



High Channel



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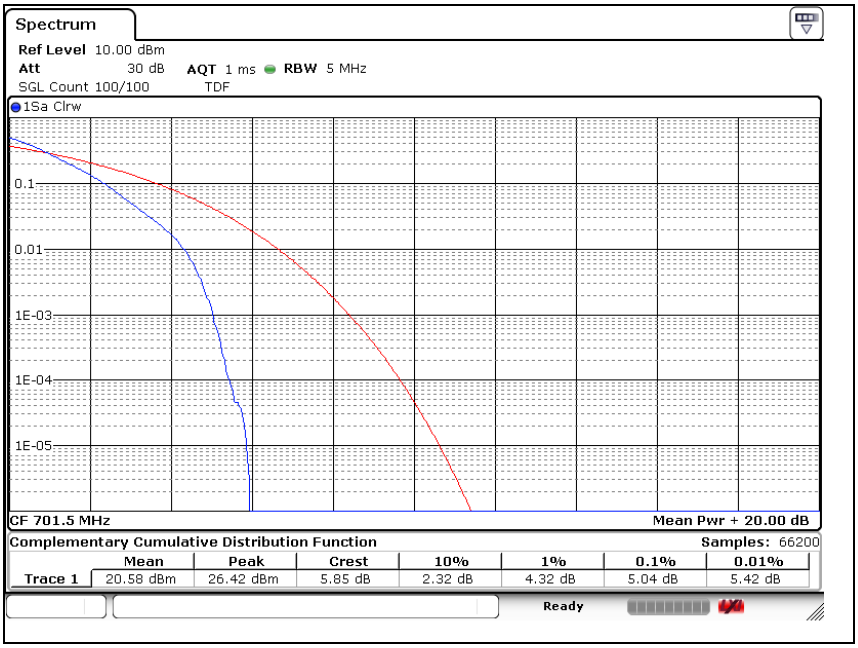
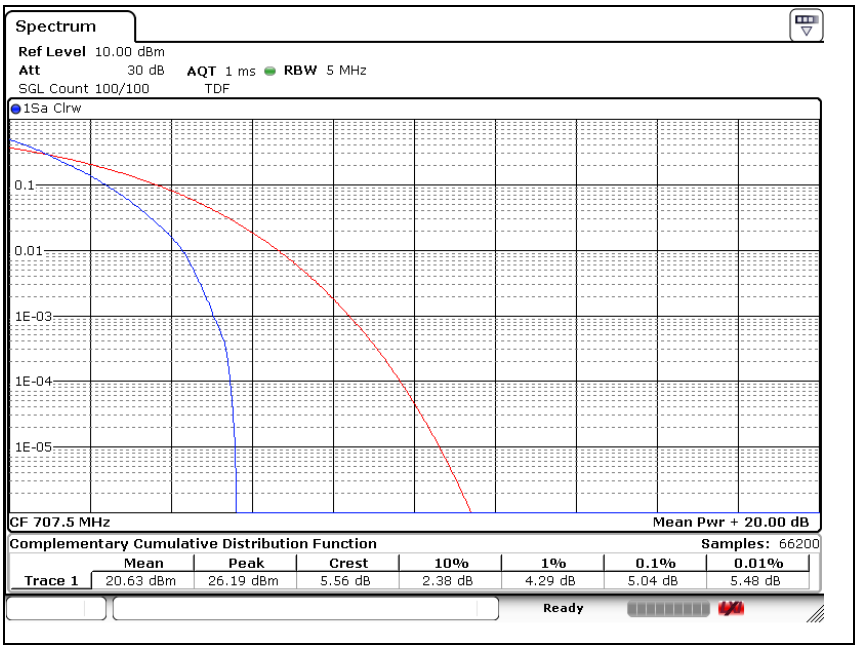
LTE band 12 (5 ㎒ - QPSK)

Low Channel



Middle Channel



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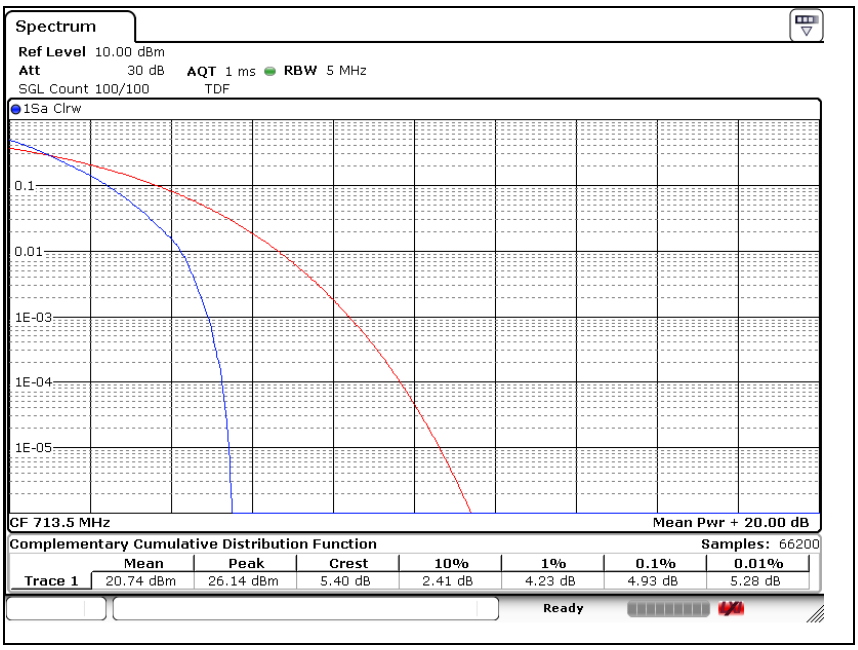
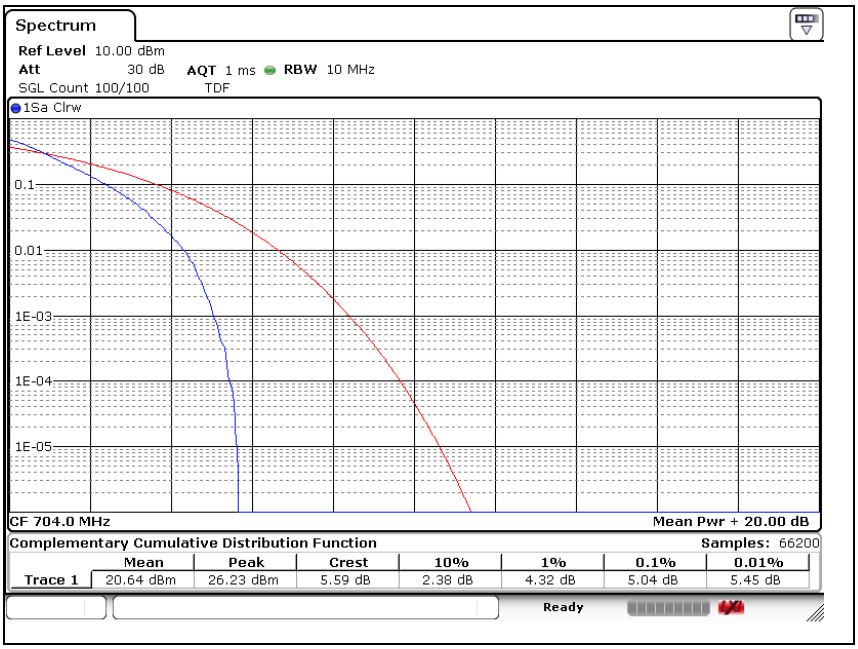
High Channel



LTE band 12 (10 ㎒ - QPSK)

Low Channel



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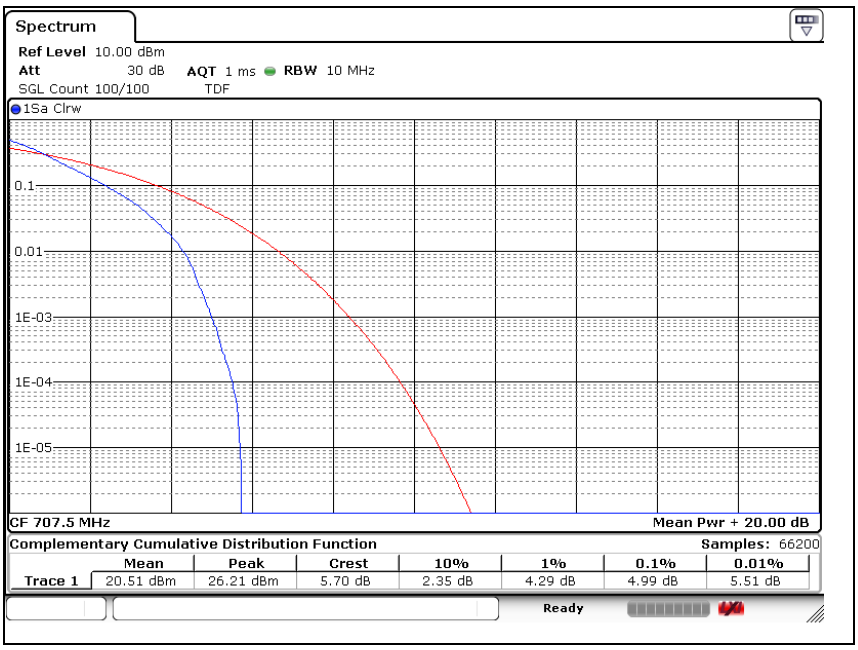
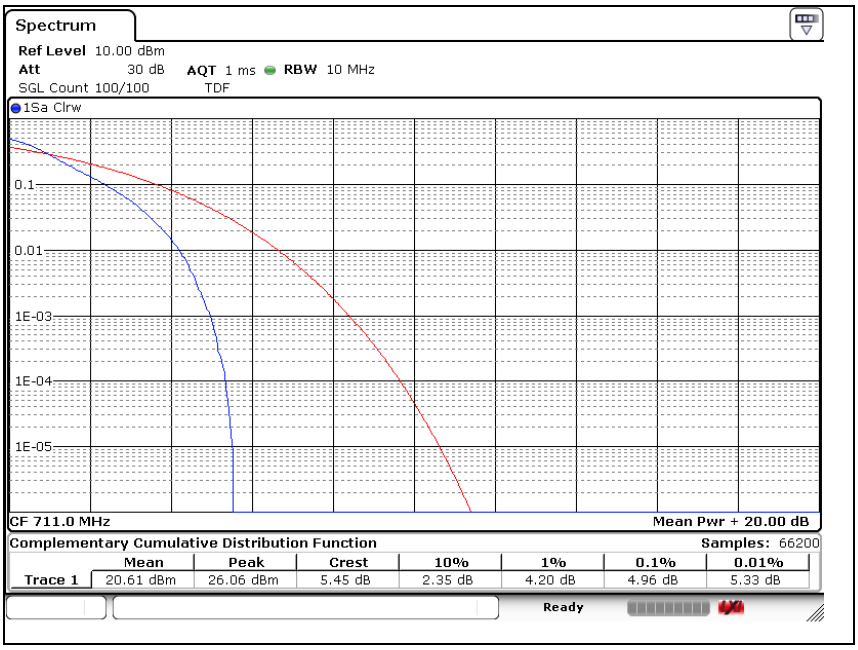
Middle Channel



High Channel



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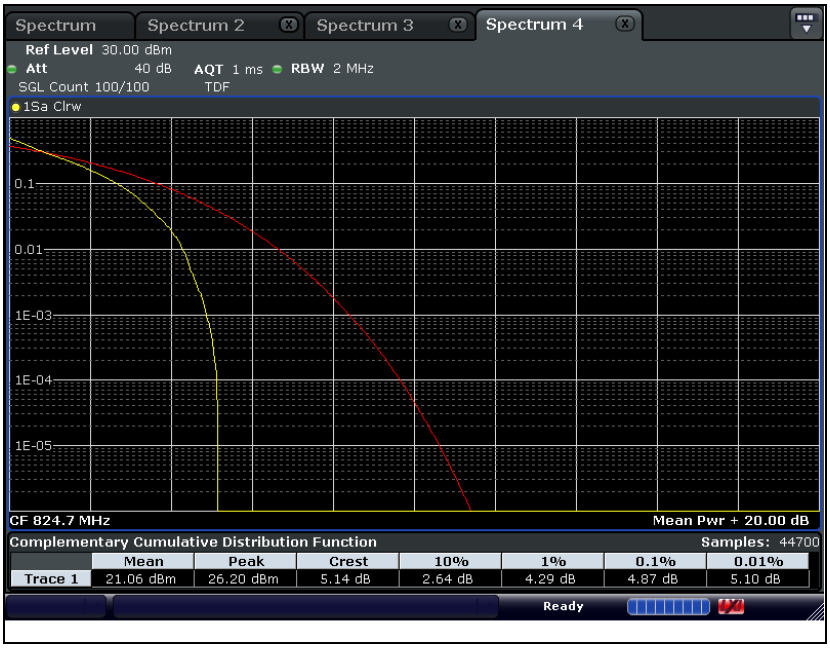
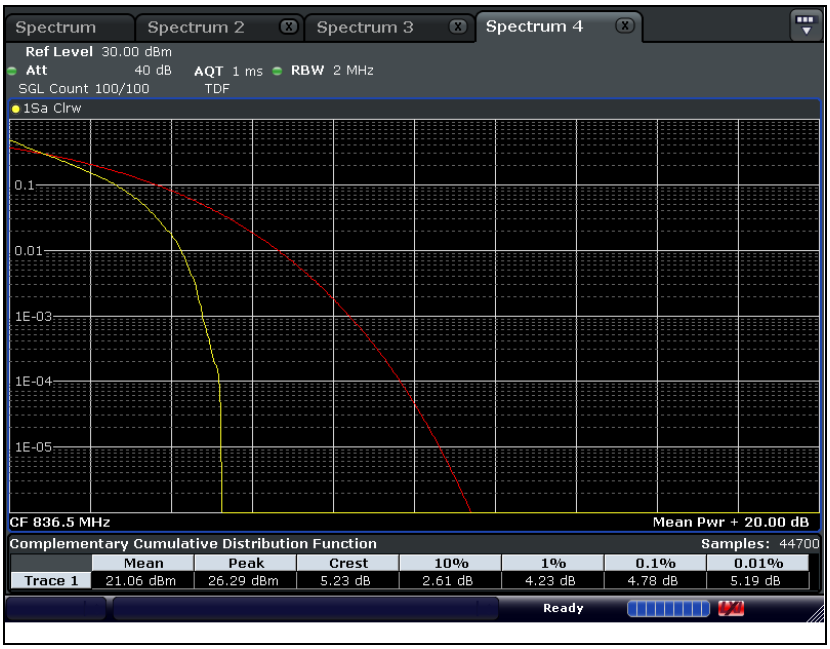
LTE band 26 (1.4 ㎒ - QPSK)

Low Channel



Middle Channel



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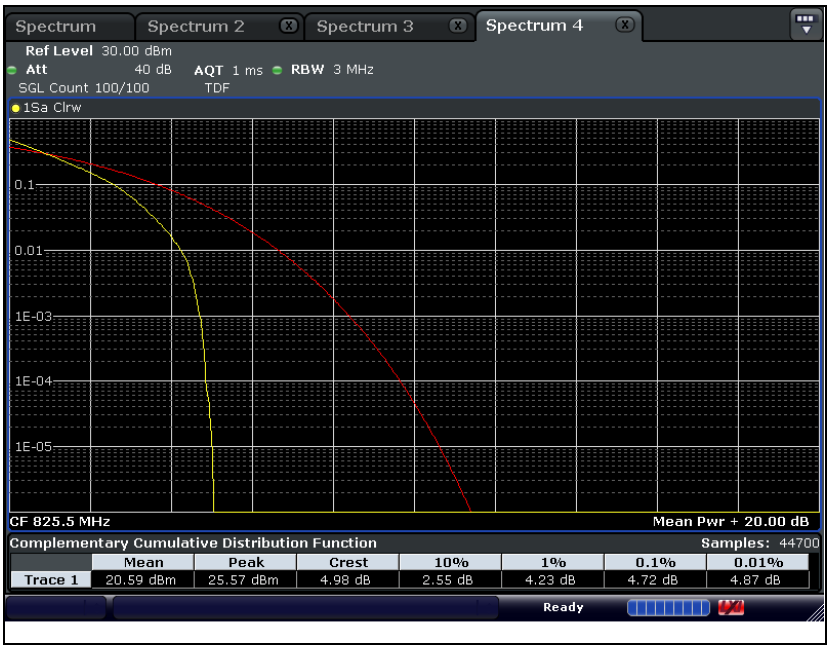
High Channel

LTE band 26 (3 ㎒ - QPSK)

Low Channel



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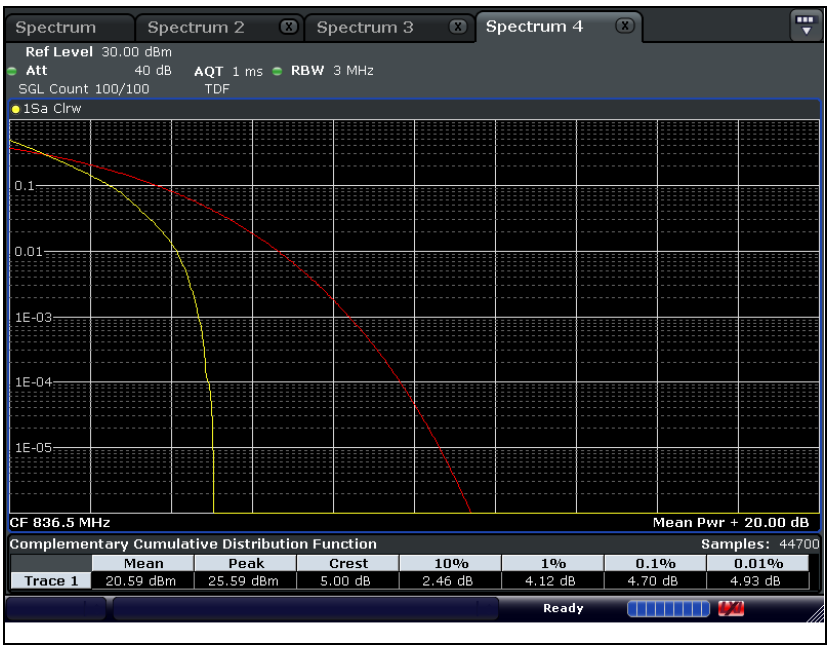
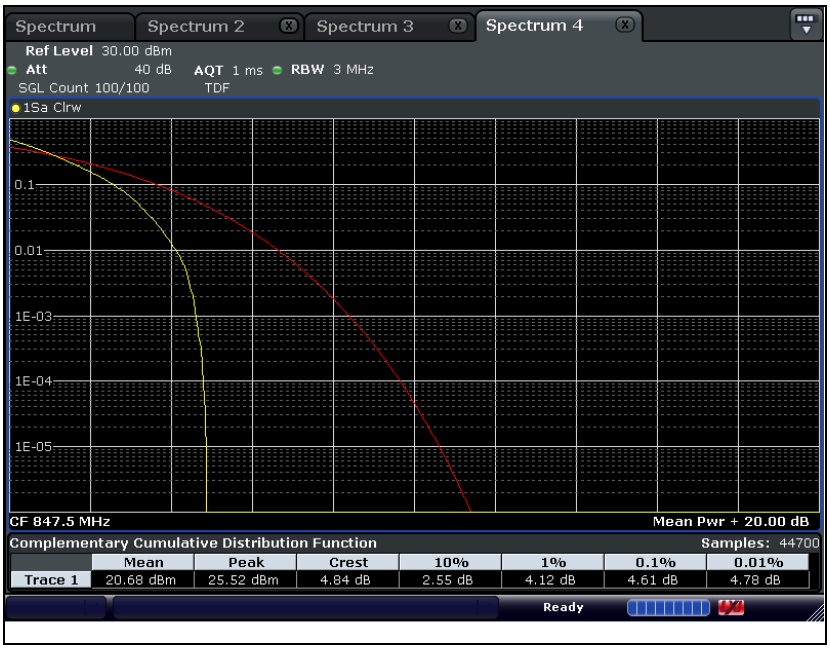
Middle Channel



High Channel



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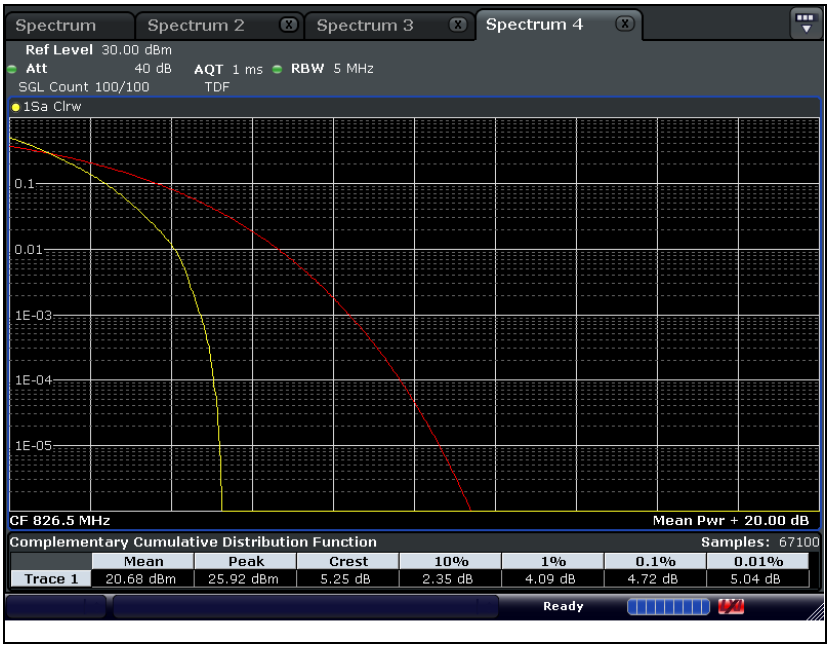
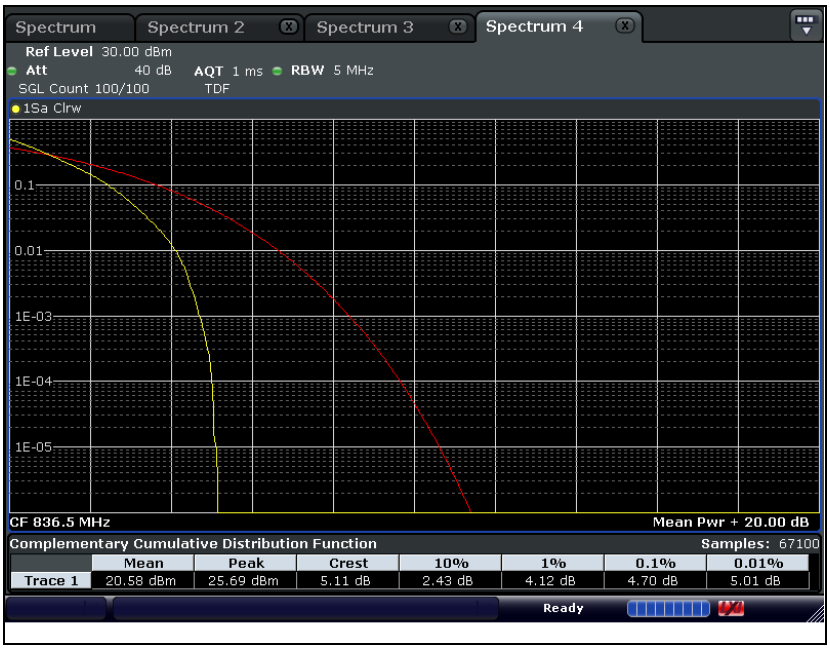
LTE band 26 (5 ㎒ - QPSK)

Low Channel



Middle Channel



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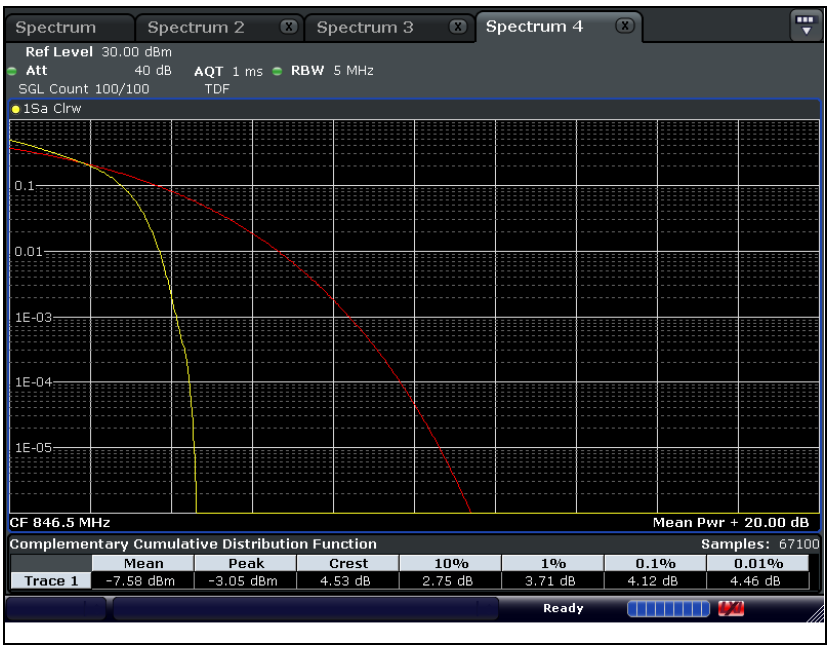
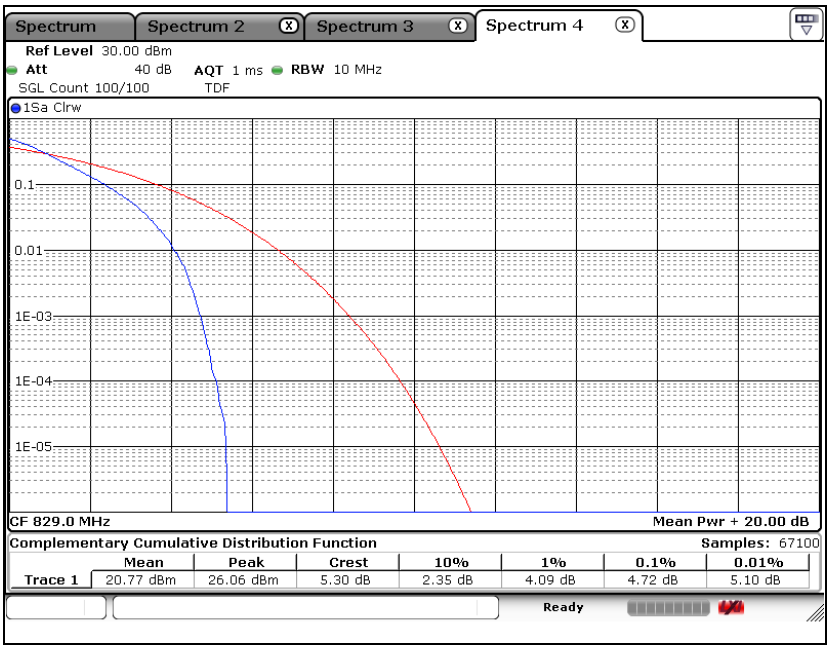
High Channel



LTE band 26 (10 ㎒ - QPSK)

Low Channel



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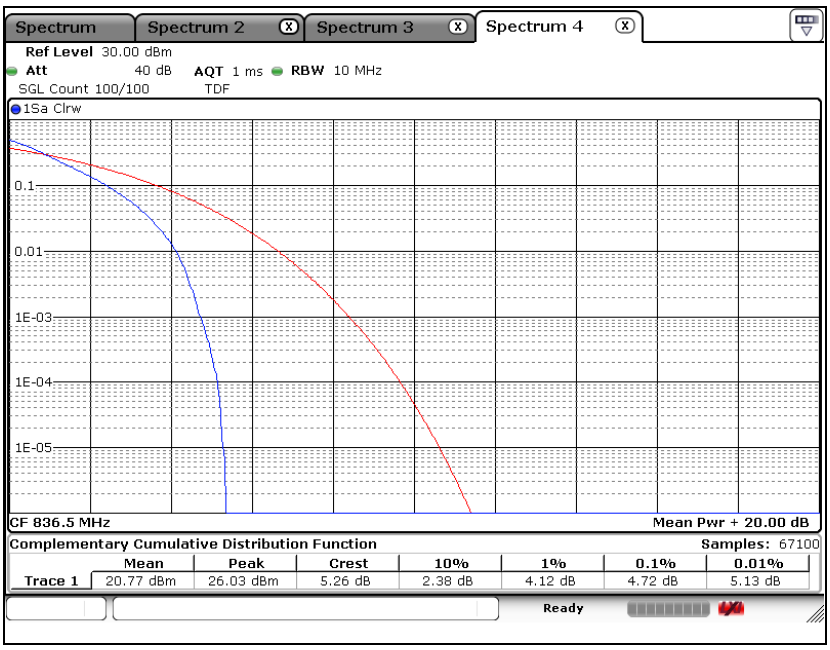
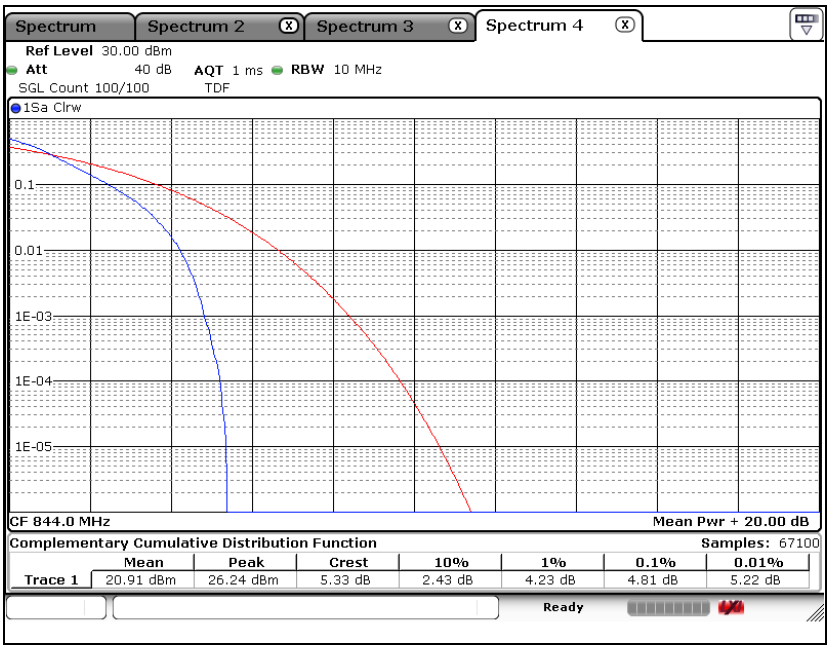
Middle Channel



High Channel



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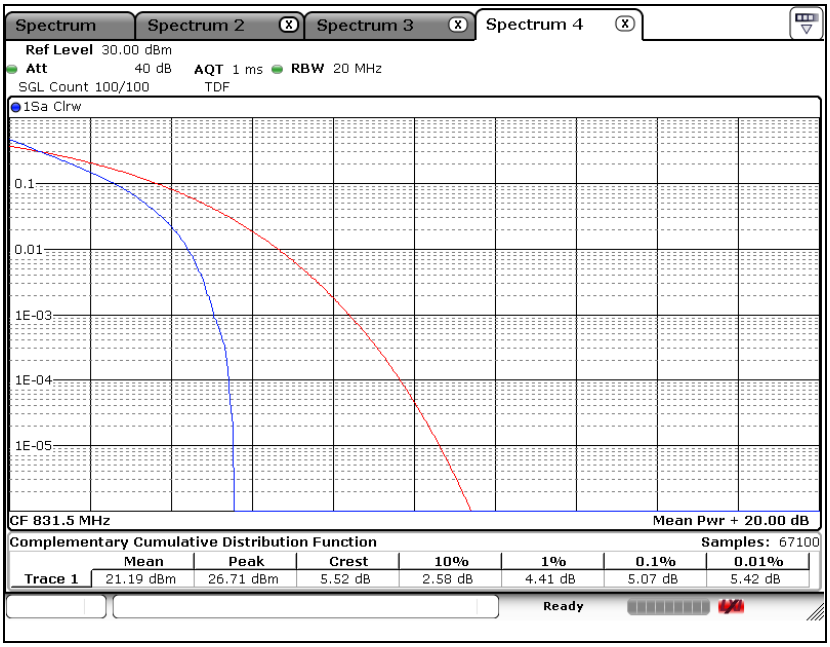
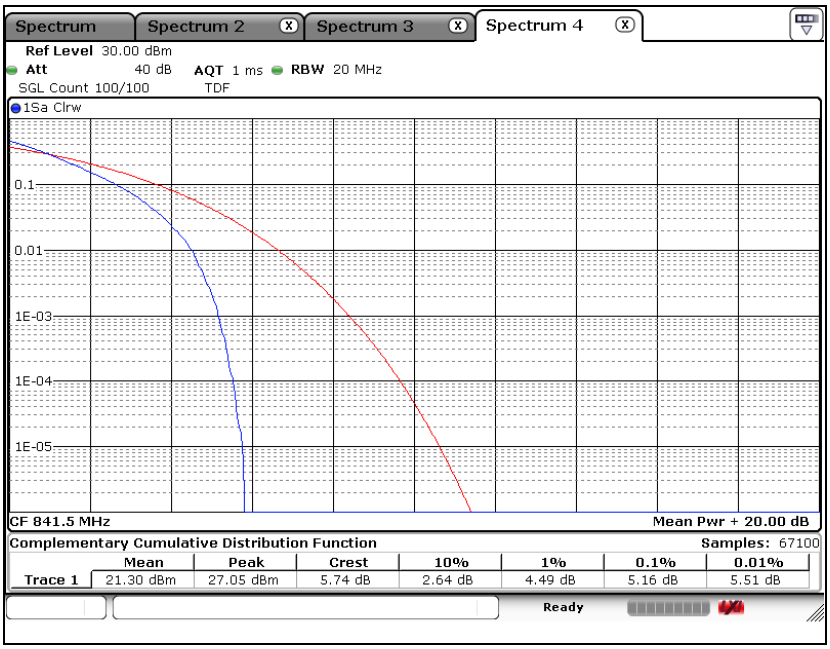
LTE band 26 (15 ㎒ - QPSK)

Low Channel



High Channel



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6. Spurious Emissions at Antenna Terminal

6.1. Limit

FCC

- §22.917(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log(P) ㎧.

- §24.238(a), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) ㎧.

- §27.53(g), the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) ㎧.

- §27.53(h)(1), for operations in the 1 695-1 710 ㎒, 1 710-1 755 ㎒, 1 755-1 780 ㎒, 1 915-1 920 ㎒, 1 995-2 000 ㎒, 2 000-2 020 ㎒, 2 110-2 155 ㎒, 2 155-2 180 ㎒, and 2 180-2 200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 $\log_{10}$ (P) ㎧.

- §27.53(m)(4), For mobile digital stations, the attenuation factor shall be not less than 40 + 10 $\log_{10}$ (P) ㎧ on all frequencies between the channel edge and 5 megahertz from the channel edge, 43 + 10 $\log_{10}$ (P) ㎧ on all frequencies between 5 megahertz and X megahertz from the channel edge, and 55 + 10 $\log_{10}$ (P) ㎧ on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less that 43 + 10 $\log_{10}$ (P) ㎧ on all frequencies between 2490.5 ㎒ and 2496 ㎒ and 55 + 10 $\log_{10}$ (P) ㎧ at or below 2490.5 ㎒. Mobile Satellite Service licensees operating on frequencies below 2495 ㎒ may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

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