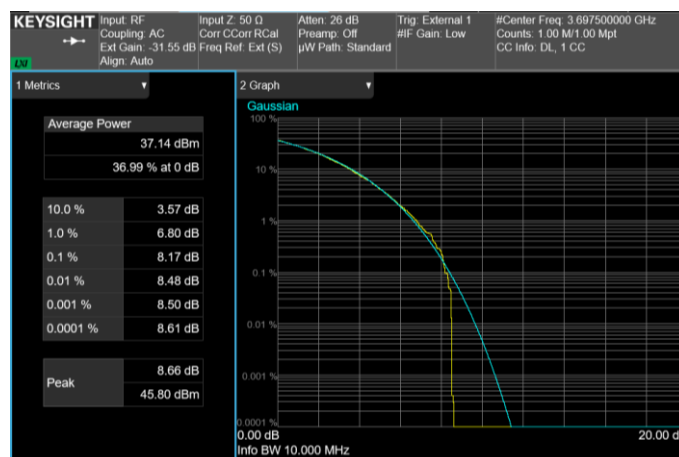
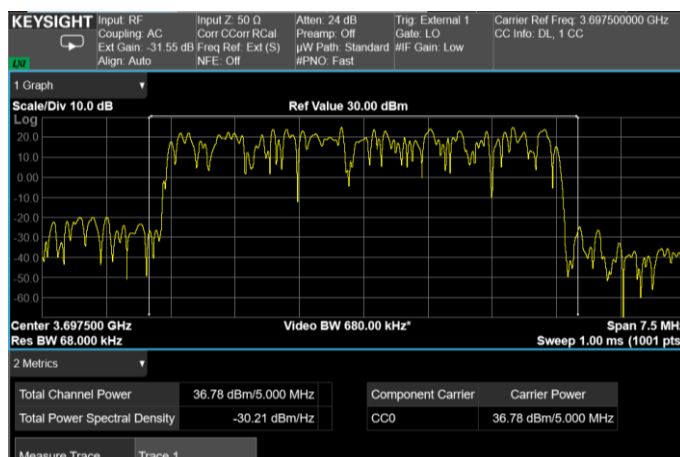
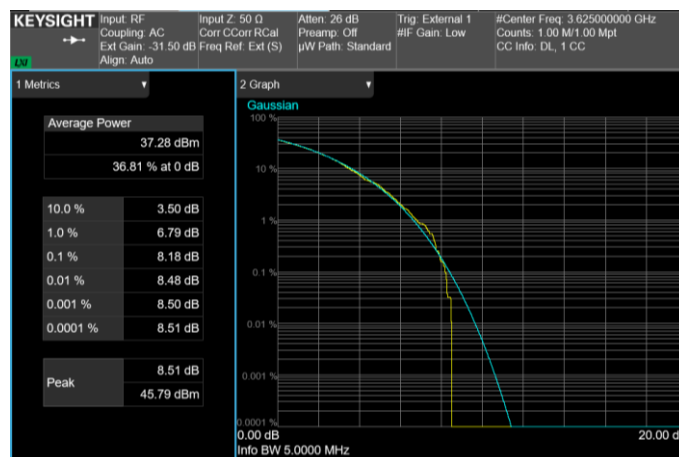
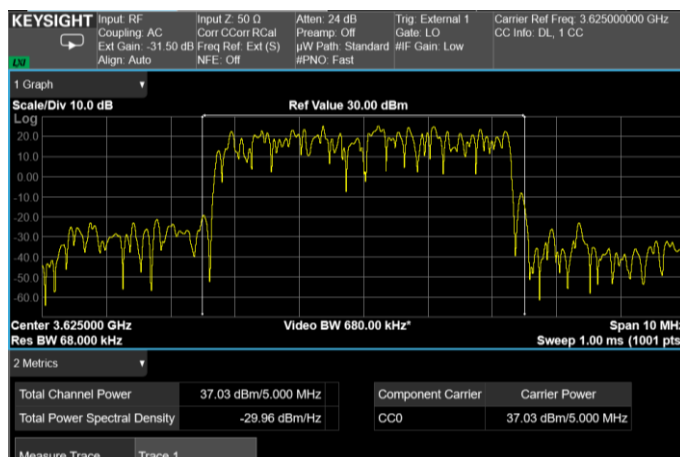
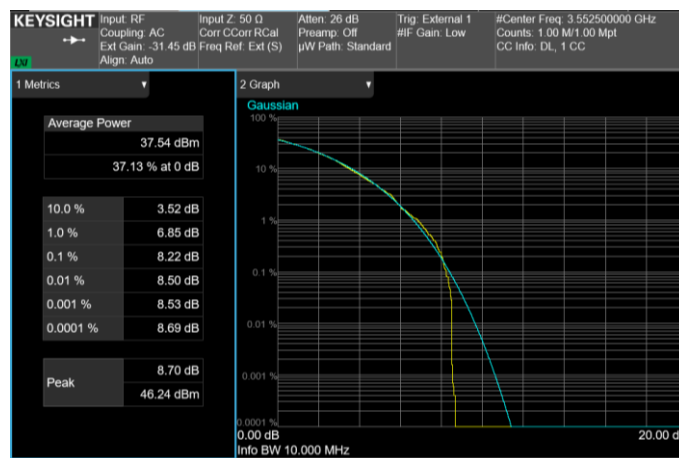
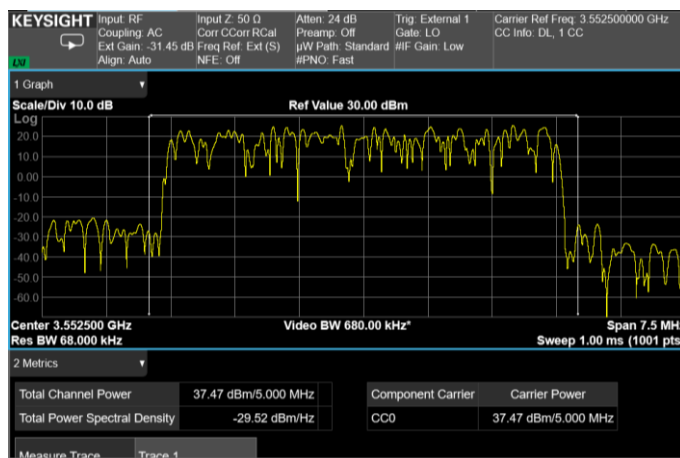
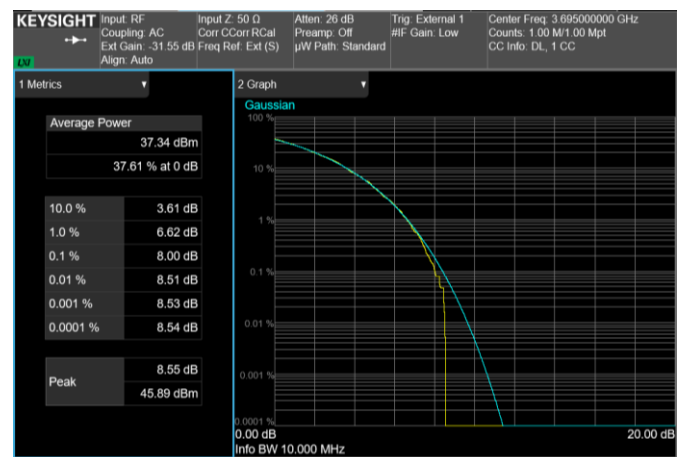
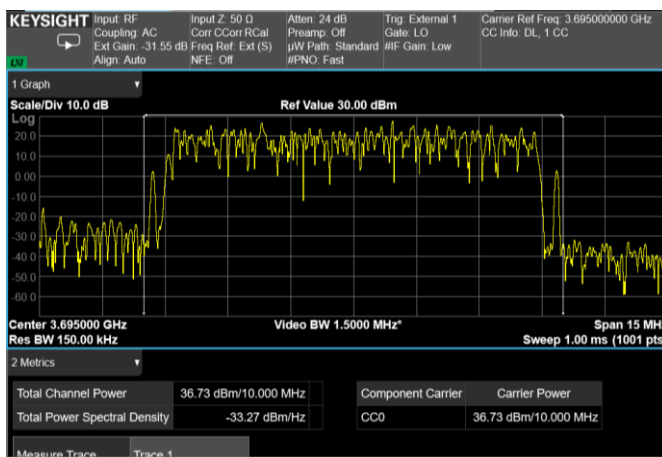
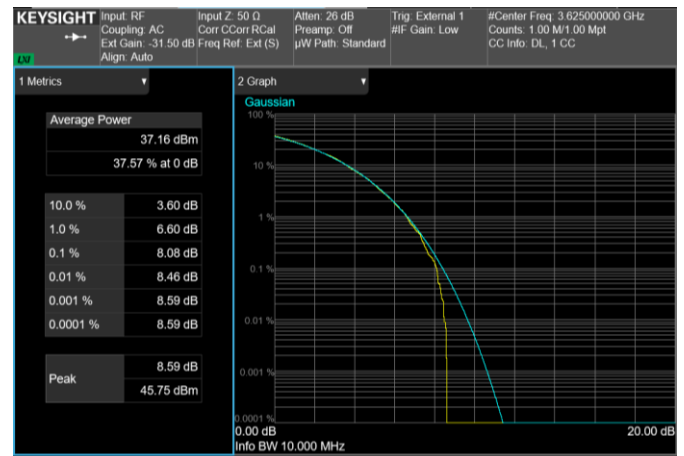
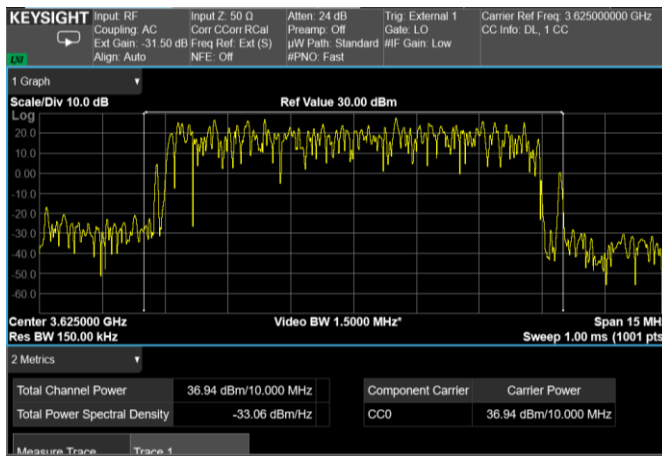
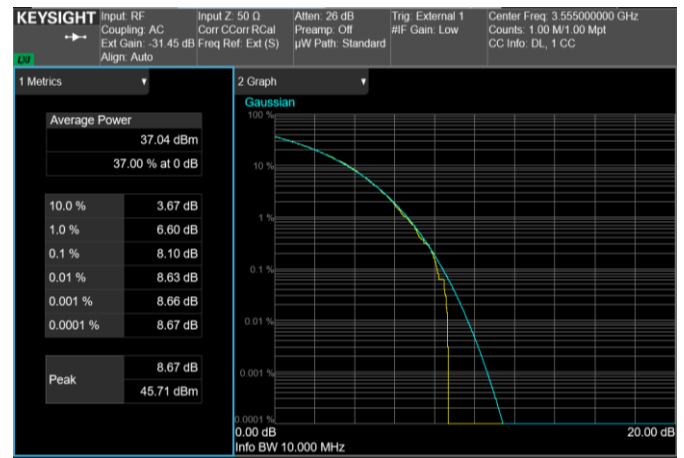
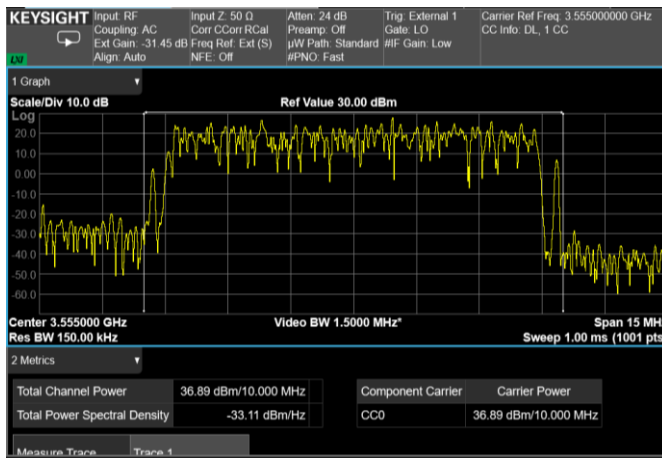
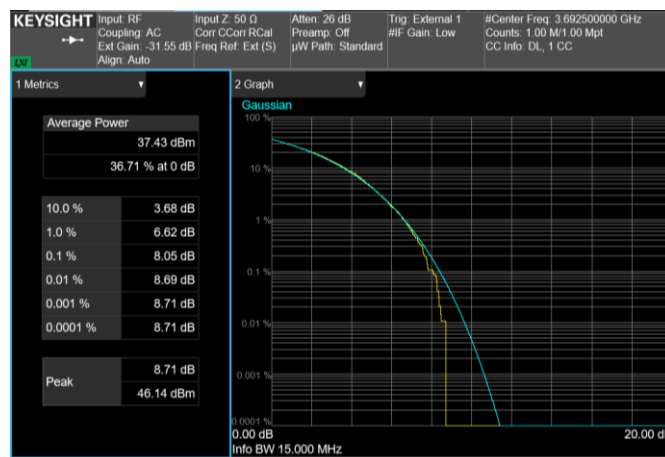
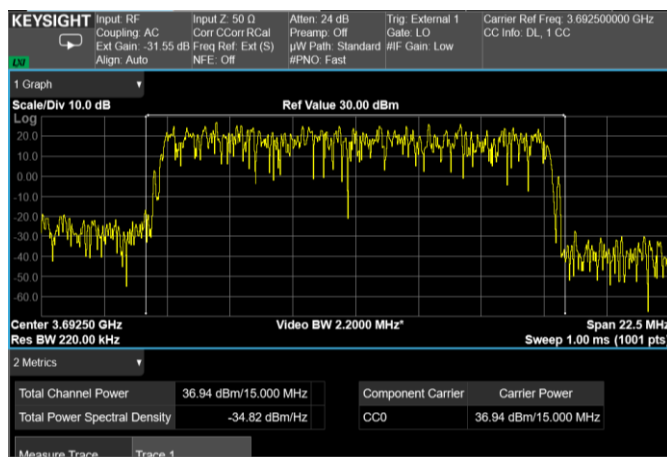
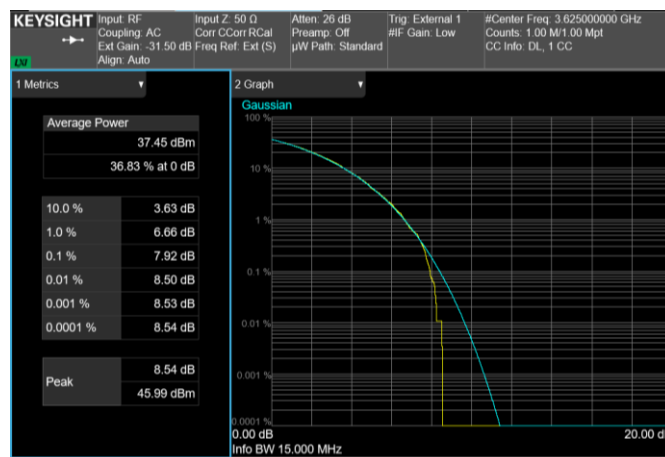
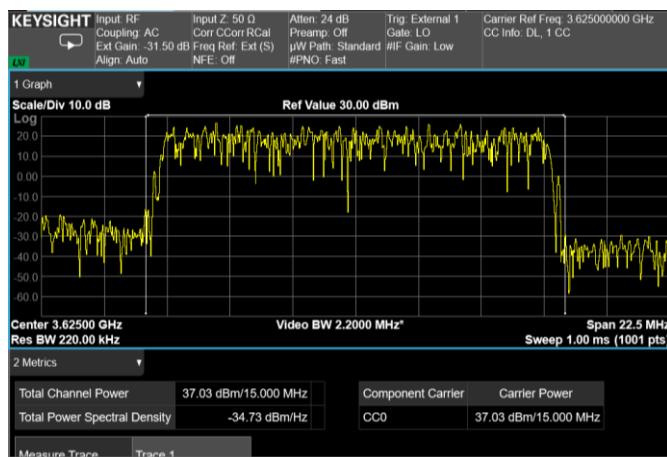
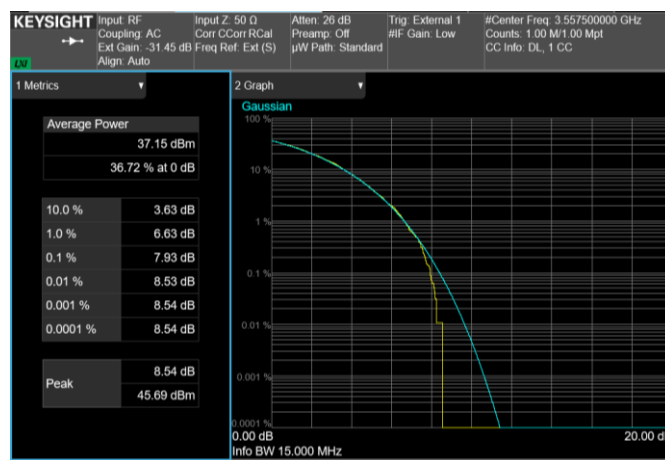
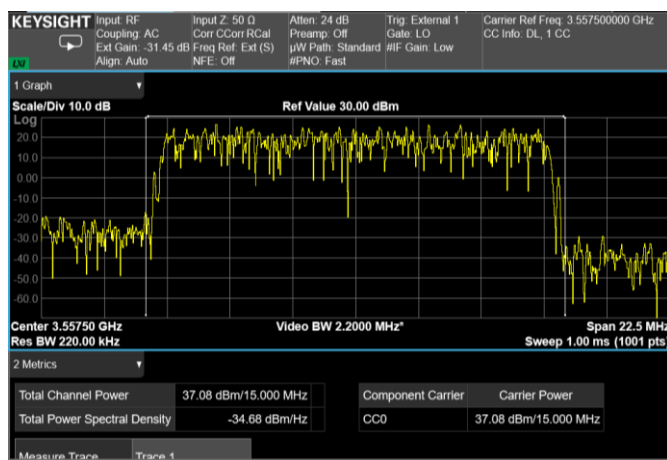
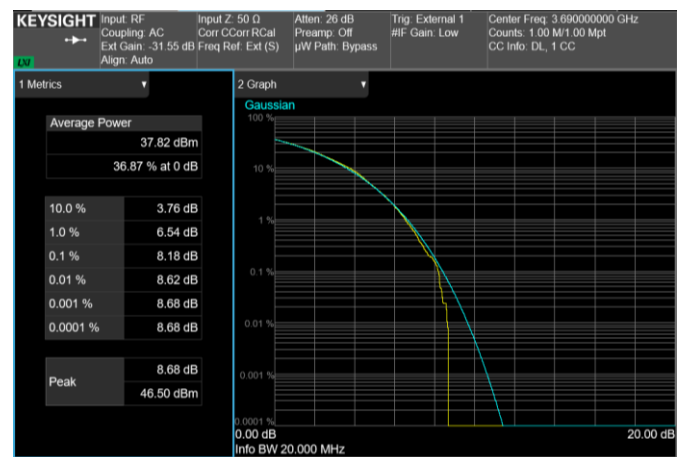
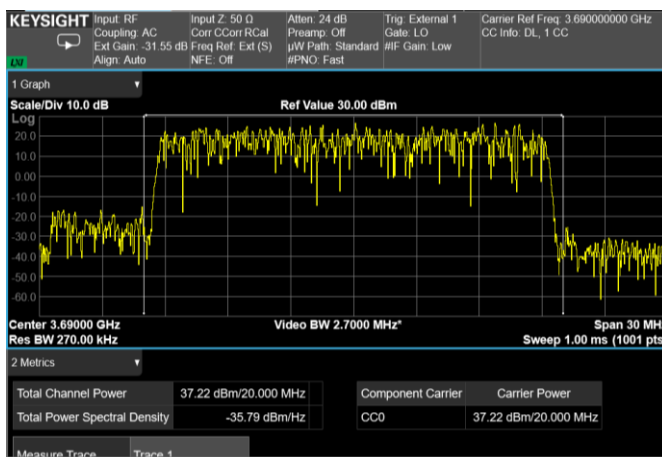
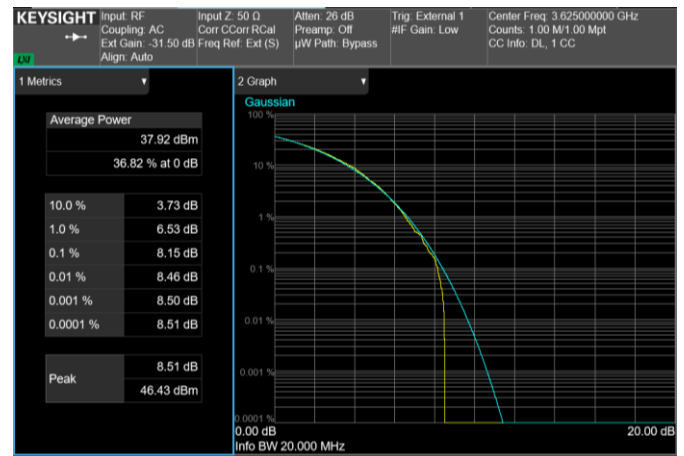
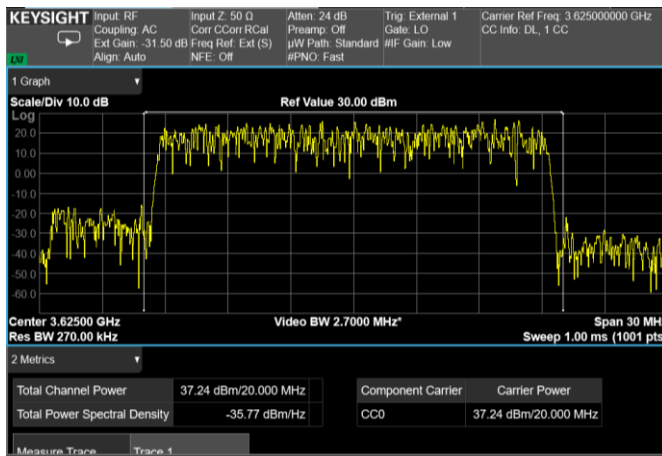
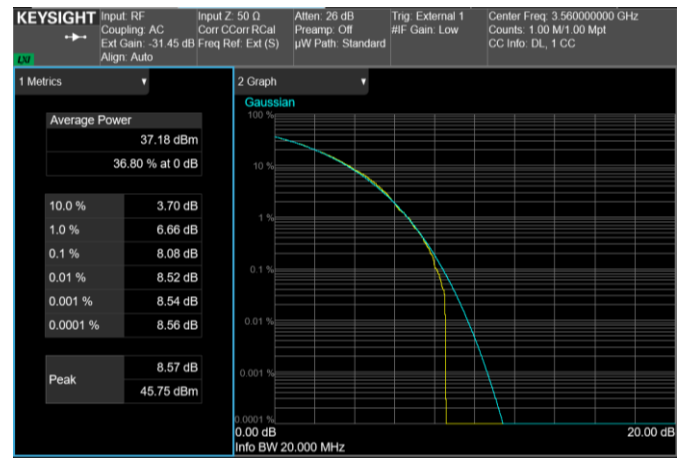
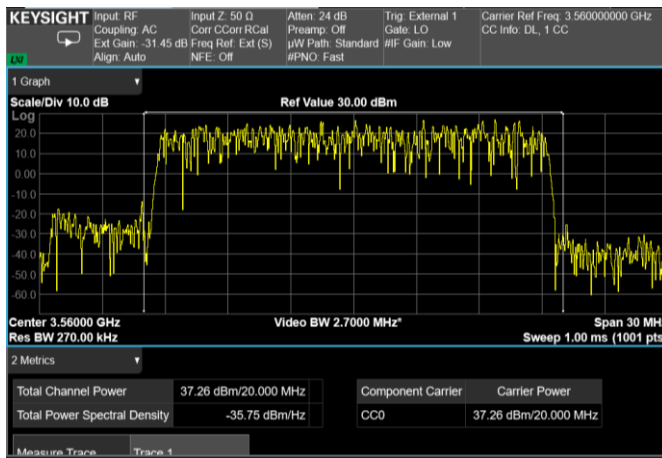


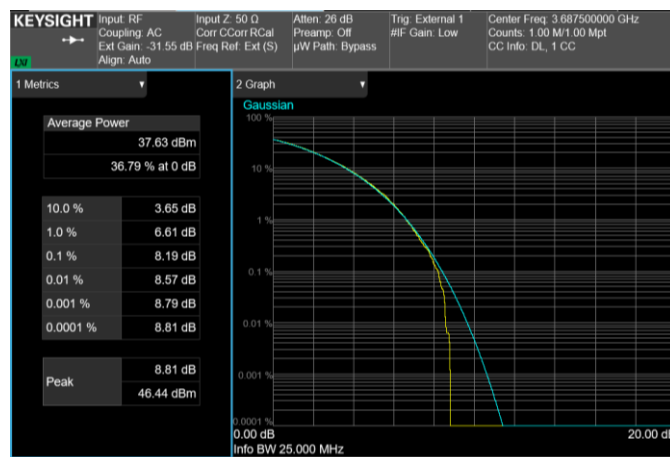
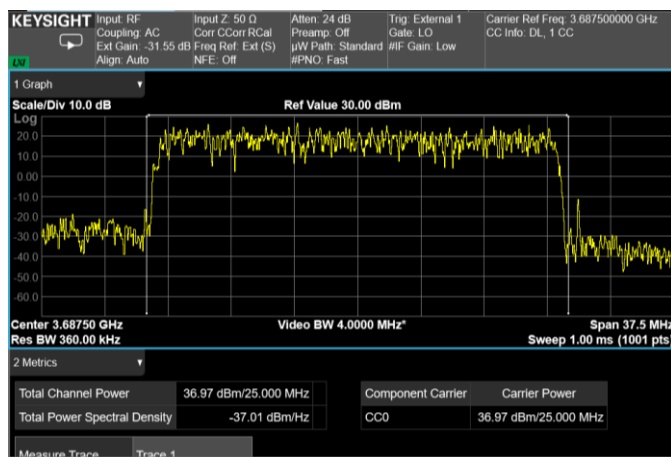
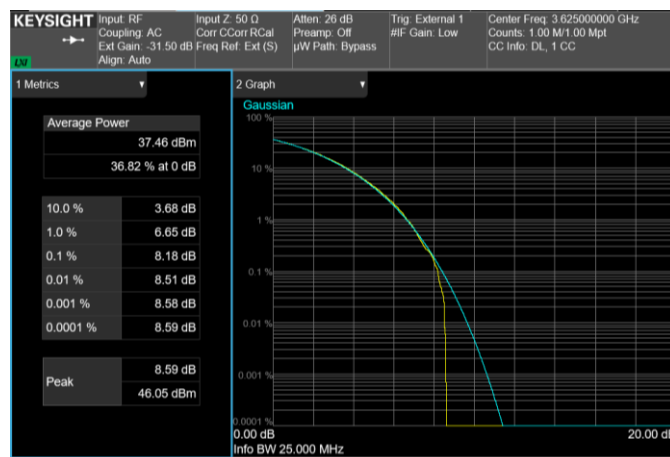
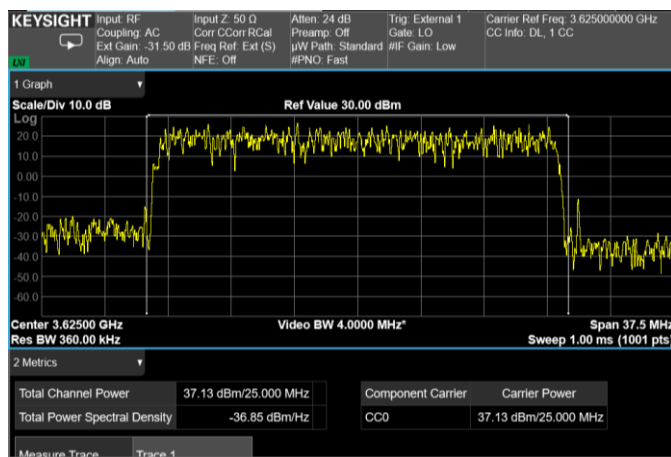
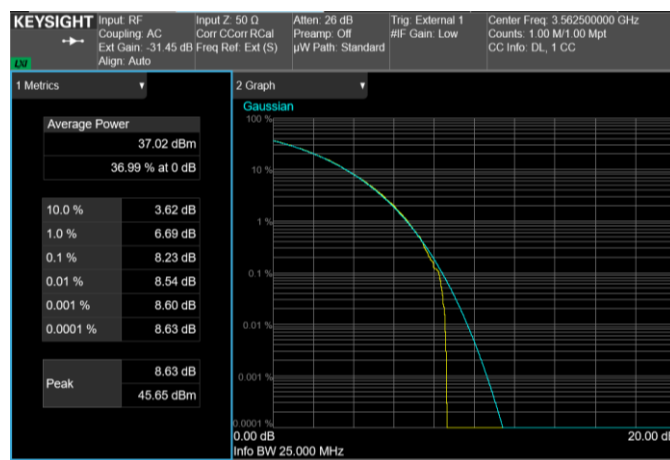
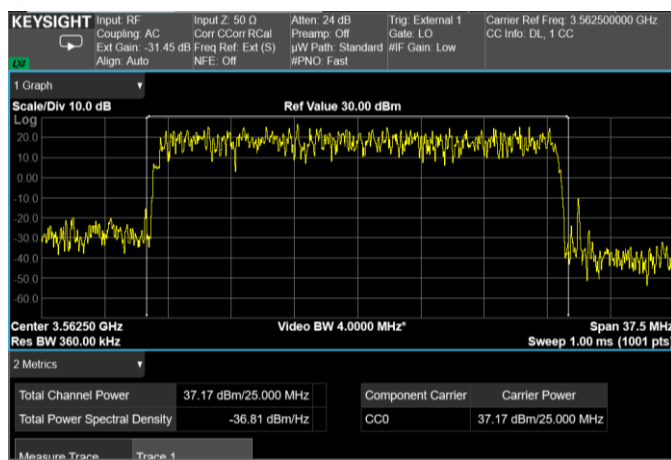
RF PORT 1 PLOT

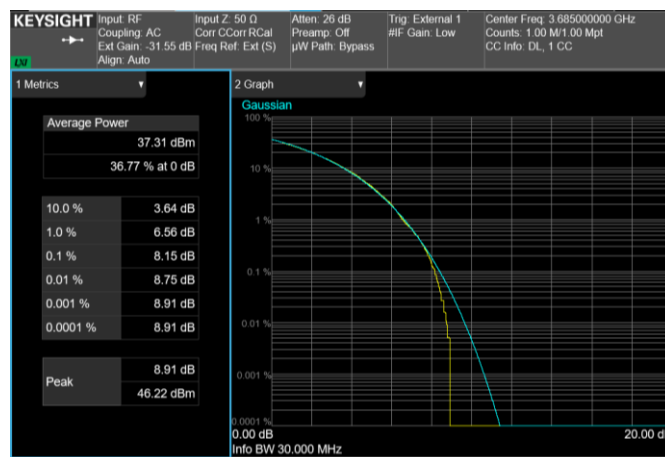
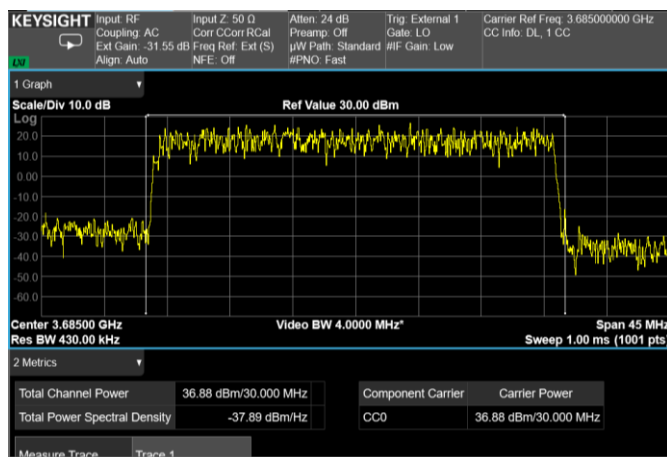
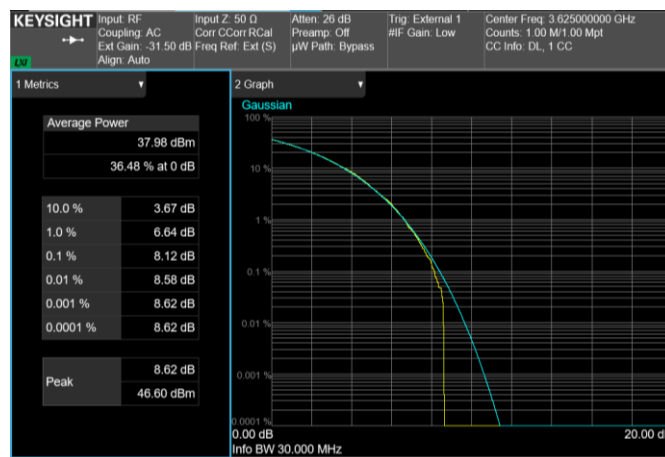
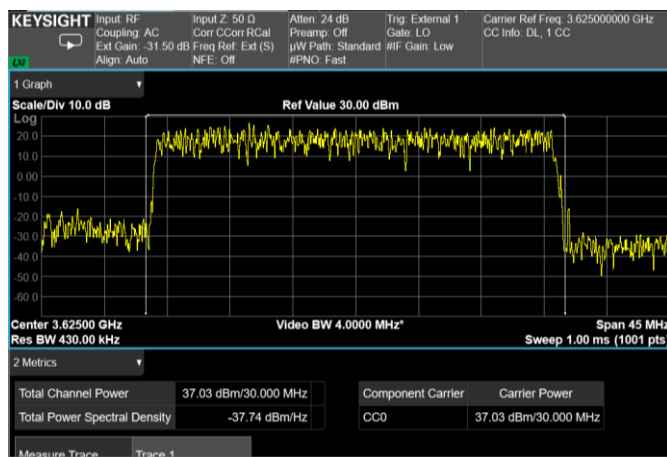
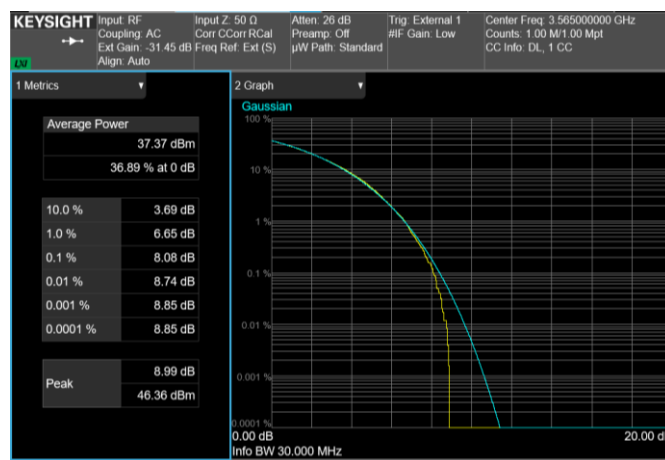
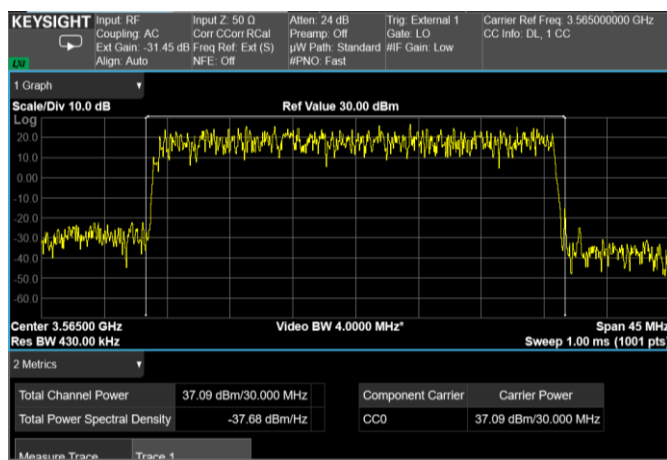


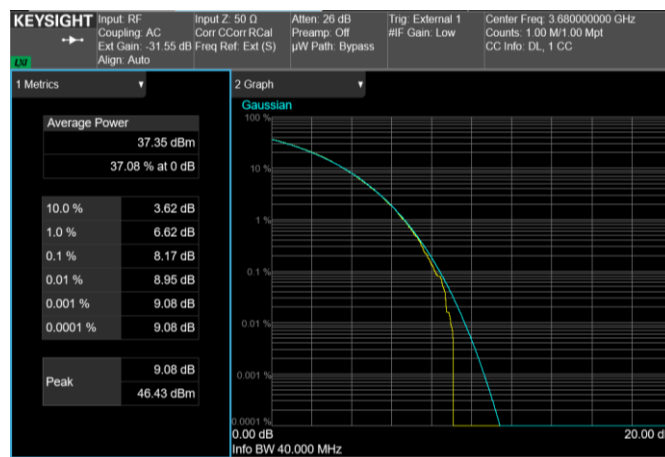
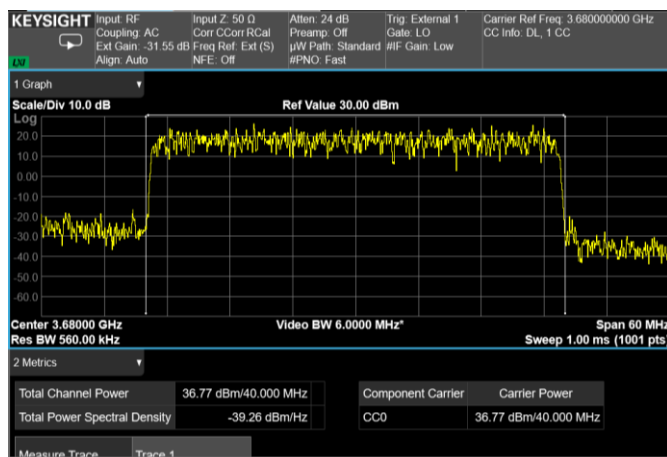
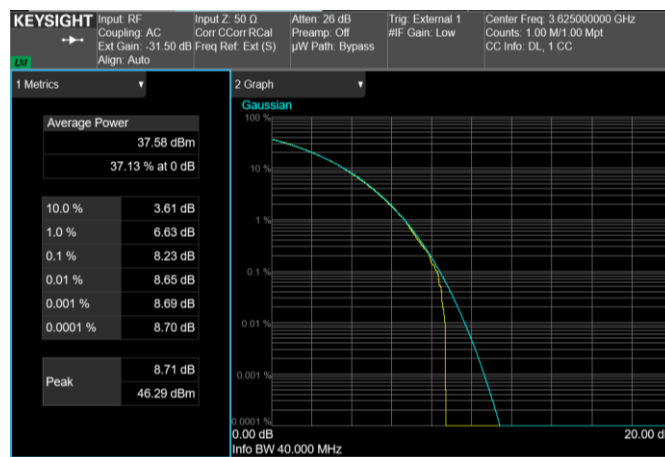
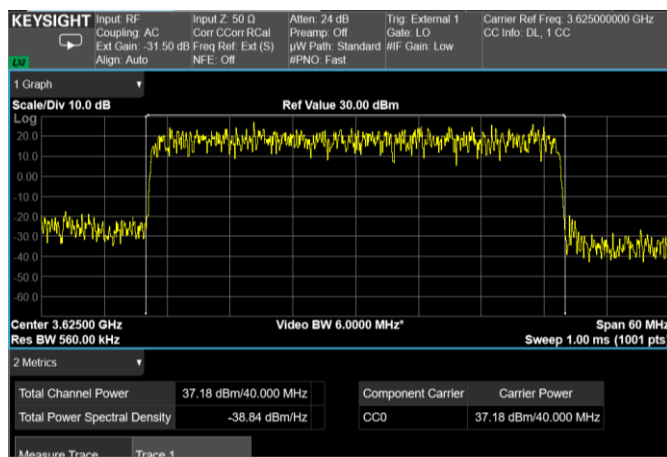
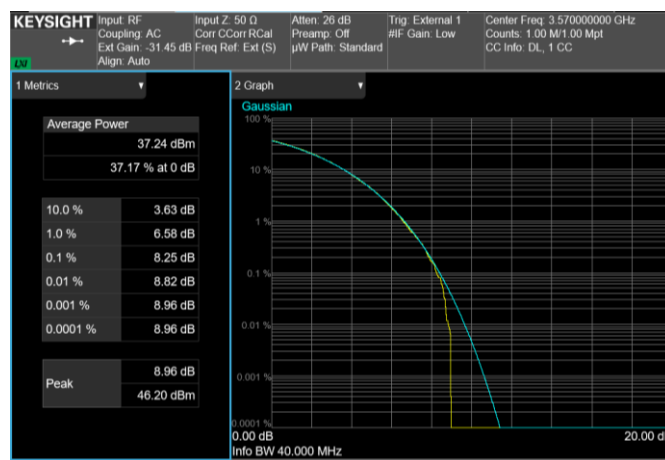
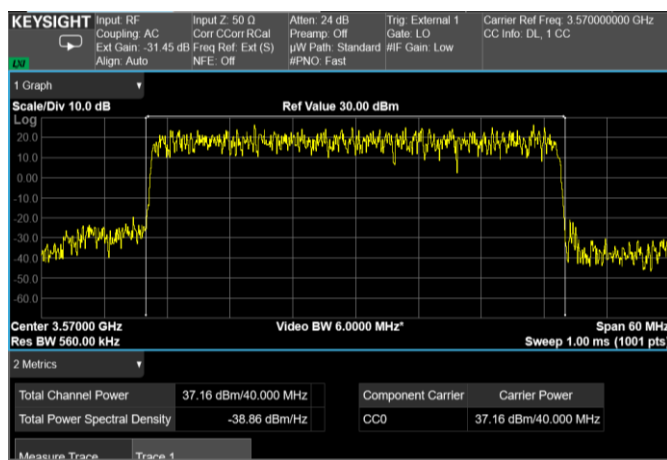


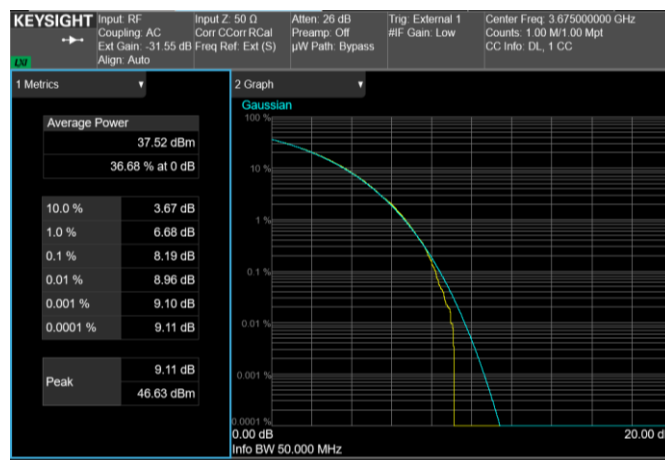
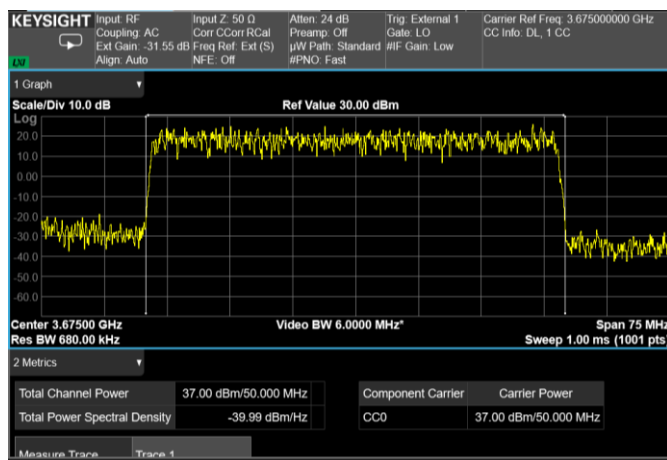
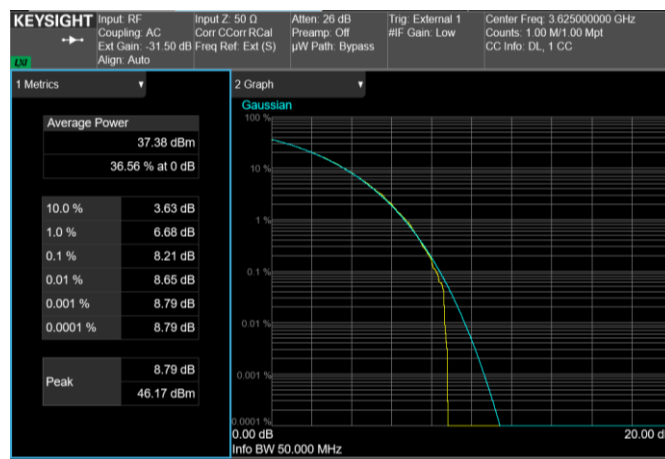
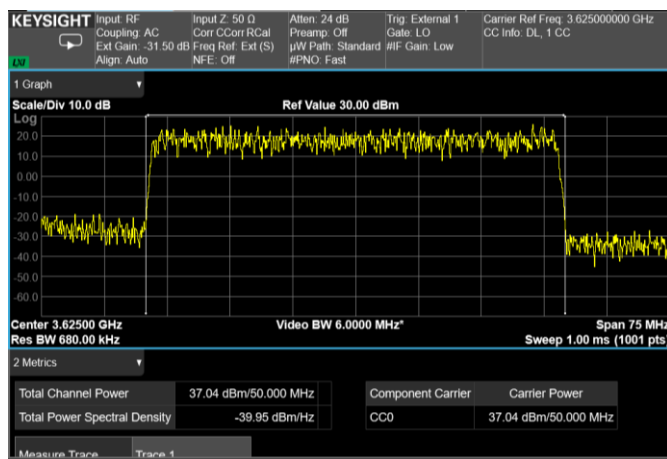
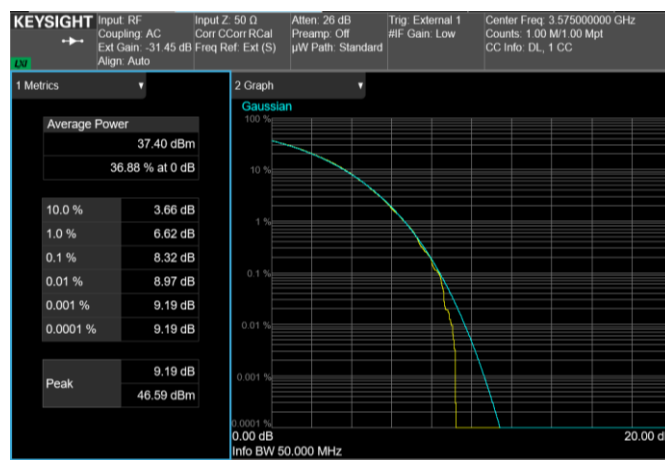
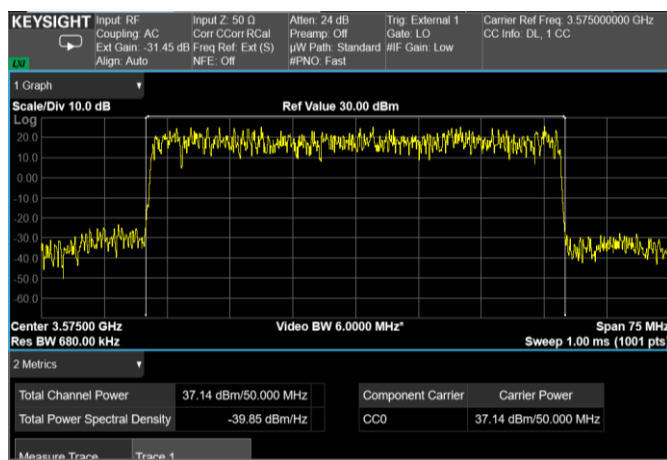


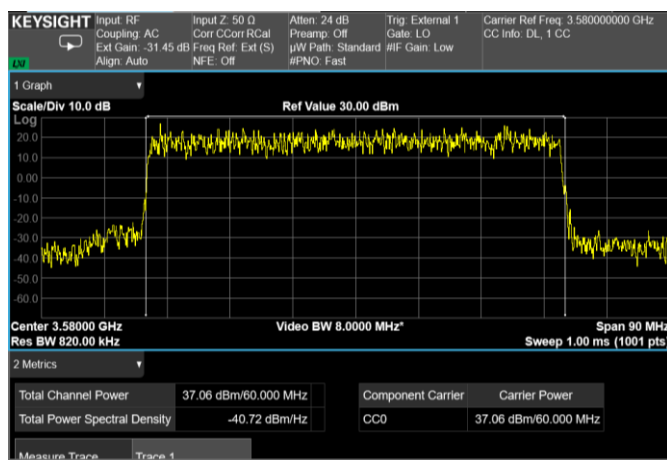
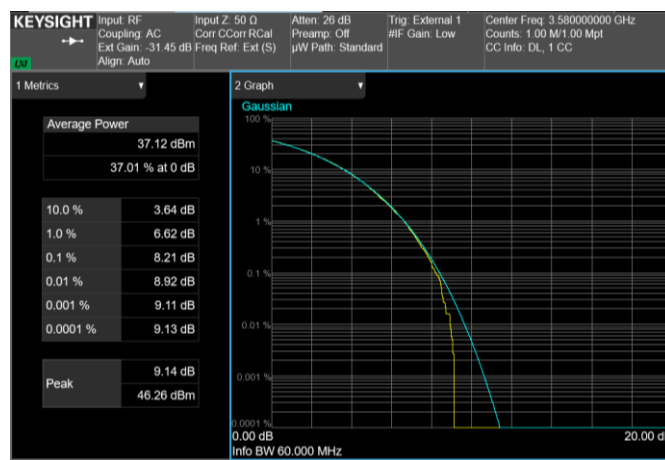
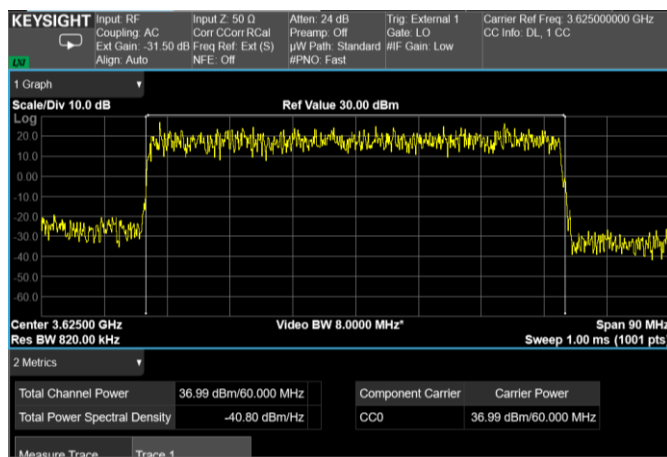
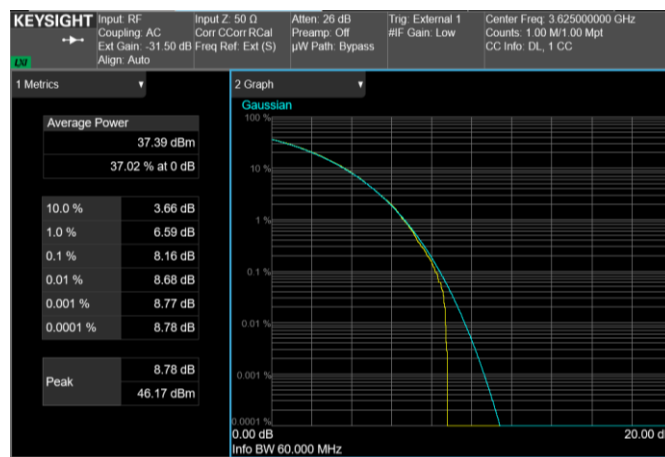
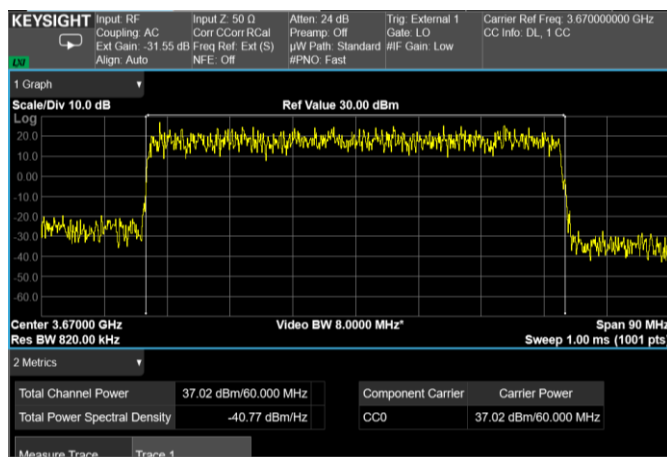
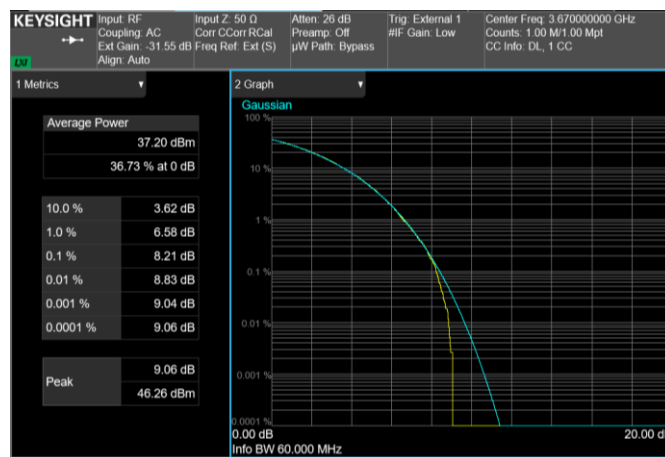











Channel: BOTTOM, Modulation: 64QAM,
BW=60MHz, Channel Power

Channel: BOTTOM, Modulation: 64QAM,
BW=60MHz, CCDF

Channel: MIDDLE, Modulation: 64QAM,
BW=60MHz, Channel Power

Channel: MIDDLE, Modulation: 64QAM,
BW=60MHz, CCDF

Channel: TOP, Modulation: 64QAM,
BW=60MHz, Channel Power

Channel: TOP, Modulation: 64QAM,
BW=60MHz, CCDF

RF PORT 2

Test data							
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	PSD (dBm/Hz)	PSD (dBm/MHz)	PAR (dB)
Down-link	5G NR 5MHz (QPSK)	3552.5	36.9	4.864	-30.1	29.9	9.3
Down-link	5G NR 5MHz (QPSK)	3625	37.0	4.989	-30.0	30.0	9.7
Down-link	5G NR 5MHz (QPSK)	3697.5	36.6	4.613	-30.4	29.7	9.7
Down-link	5G NR 5MHz (16QAM)	3552.5	36.9	4.875	-30.1	29.9	9.7
Down-link	5G NR 5MHz (16QAM)	3625	37.0	5.012	-30.0	30.0	9.8
Down-link	5G NR 5MHz (16QAM)	3697.5	36.5	4.498	-30.5	29.6	9.7
Down-link	5G NR 5MHz (64QAM)	3552.5	37.0	4.977	-30.0	30.0	9.7
Down-link	5G NR 5MHz (64QAM)	3625	37.0	4.977	-30.0	30.0	9.7
Down-link	5G NR 5MHz (64QAM)	3697.5	36.7	4.634	-30.3	29.7	9.7
Down-link	5G NR 5MHz (256QAM)	3552.5	36.9	4.875	-30.1	29.9	9.7
Down-link	5G NR 5MHz (256QAM)	3625	37.0	4.989	-30.0	30.0	9.7
Down-link	5G NR 5MHz (256QAM)	3697.5	36.7	4.656	-30.3	29.7	9.7
Down-link	5G NR 10MHz (QPSK)	3555	37.2	5.224	-32.8	27.2	8.7
Down-link	5G NR 10MHz (QPSK)	3625	37.0	4.977	-33.0	27.0	8.4
Down-link	5G NR 10MHz (QPSK)	3695	36.8	4.819	-33.2	26.8	8.6
Down-link	5G NR 10MHz (16QAM)	3555	37.2	5.236	-32.8	27.2	8.6
Down-link	5G NR 10MHz (16QAM)	3625	37.0	4.966	-33.0	27.0	8.5
Down-link	5G NR 10MHz (16QAM)	3695	36.8	4.819	-33.2	26.8	8.7
Down-link	5G NR 10MHz (64QAM)	3555	37.2	5.212	-32.8	27.2	8.6
Down-link	5G NR 10MHz (64QAM)	3625	37.0	4.955	-33.1	27.0	8.4
Down-link	5G NR 10MHz (64QAM)	3695	36.8	4.808	-33.2	26.8	8.6
Down-link	5G NR 10MHz (256QAM)	3555	37.2	5.224	-32.8	27.2	8.6
Down-link	5G NR 10MHz (256QAM)	3625	37.0	4.989	-33.0	27.0	8.5

Test data							
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	PSD (dBm/Hz)	PSD (dBm/MHz)	PAR (dB)
Down-link	5G NR 10MHz (256QAM)	3695	36.8	4.797	-33.2	26.8	8.6
Down-link	5G NR 15MHz (QPSK)	3557.5	37.0	5.023	-34.8	25.3	8.7
Down-link	5G NR 15MHz (QPSK)	3625	37.0	5.023	-34.8	25.3	8.6
Down-link	5G NR 15MHz (QPSK)	3692.5	36.9	4.864	-34.9	25.1	8.8
Down-link	5G NR 15MHz (16QAM)	3557.5	37.0	5.047	-34.7	25.3	8.6
Down-link	5G NR 15MHz (16QAM)	3625	37.1	5.070	-34.7	25.3	8.7
Down-link	5G NR 15MHz (16QAM)	3692.5	36.9	4.842	-34.9	25.1	8.8
Down-link	5G NR 15MHz (64QAM)	3557.5	37.0	5.023	-34.8	25.3	8.7
Down-link	5G NR 15MHz (64QAM)	3625	37.1	5.070	-34.7	25.3	8.6
Down-link	5G NR 15MHz (64QAM)	3692.5	36.7	4.721	-35.0	25.0	8.8
Down-link	5G NR 15MHz (256QAM)	3557.5	37.0	5.035	-34.8	25.3	8.6
Down-link	5G NR 15MHz (256QAM)	3625	37.0	5.023	-34.8	25.3	8.6
Down-link	5G NR 15MHz (256QAM)	3692.5	36.9	4.842	-34.9	25.1	8.8
Down-link	5G NR 20MHz (QPSK)	3560	37.3	5.309	-35.8	24.2	8.7
Down-link	5G NR 20MHz (QPSK)	3625	37.1	5.105	-35.9	24.1	8.5
Down-link	5G NR 20MHz (QPSK)	3690	37.1	5.140	-35.9	24.1	8.7
Down-link	5G NR 20MHz (16QAM)	3560	37.3	5.309	-35.8	24.2	8.7
Down-link	5G NR 20MHz (16QAM)	3625	37.1	5.117	-35.9	24.1	8.5
Down-link	5G NR 20MHz (16QAM)	3690	37.1	5.152	-35.9	24.1	8.7
Down-link	5G NR 20MHz (64QAM)	3560	37.2	5.297	-35.8	24.2	8.7
Down-link	5G NR 20MHz (64QAM)	3625	37.1	5.093	-35.9	24.1	8.5
Down-link	5G NR 20MHz (64QAM)	3690	37.1	5.140	-35.9	24.1	8.7
Down-link	5G NR 20MHz (256QAM)	3560	37.3	5.309	-35.8	24.2	8.7
Down-link	5G NR 20MHz (256QAM)	3625	37.1	5.140	-35.9	24.1	8.5

Test data							
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	PSD (dBm/Hz)	PSD (dBm/MHz)	PAR (dB)
Down-link	5G NR 20MHz (256QAM)	3690	37.1	5.129	-35.9	24.1	8.7
Down-link	5G NR 25MHz (QPSK)	3562.5	37.1	5.082	-36.9	23.1	8.6
Down-link	5G NR 25MHz (QPSK)	3625	37.1	5.176	-36.8	23.2	8.8
Down-link	5G NR 25MHz (QPSK)	3687.5	36.8	4.808	-37.2	22.8	8.8
Down-link	5G NR 25MHz (16QAM)	3562.5	37.1	5.082	-36.9	23.1	8.8
Down-link	5G NR 25MHz (16QAM)	3625	37.1	5.176	-36.8	23.2	8.6
Down-link	5G NR 25MHz (16QAM)	3687.5	36.8	4.819	-37.1	22.9	8.8
Down-link	5G NR 25MHz (64QAM)	3562.5	37.1	5.082	-36.9	23.1	8.6
Down-link	5G NR 25MHz (64QAM)	3625	37.1	5.164	-36.8	23.2	8.6
Down-link	5G NR 25MHz (64QAM)	3687.5	36.8	4.831	-37.1	22.9	8.7
Down-link	5G NR 25MHz (256QAM)	3562.5	37.1	5.082	-36.9	23.1	8.6
Down-link	5G NR 25MHz (256QAM)	3625	37.1	5.152	-36.9	23.1	8.6
Down-link	5G NR 25MHz (256QAM)	3687.5	36.8	4.808	-37.2	22.8	8.8
Down-link	5G NR 30MHz (QPSK)	3565	37.1	5.117	-37.7	22.3	8.7
Down-link	5G NR 30MHz (QPSK)	3625	37.0	4.966	-37.8	22.2	8.6
Down-link	5G NR 30MHz (QPSK)	3685	37.0	5.047	-37.7	22.3	8.9
Down-link	5G NR 30MHz (16QAM)	3565	37.1	5.105	-37.7	22.3	8.7
Down-link	5G NR 30MHz (16QAM)	3625	37.0	4.977	-37.8	22.2	8.6
Down-link	5G NR 30MHz (16QAM)	3685	37.1	5.070	-37.7	22.3	8.9
Down-link	5G NR 30MHz (64QAM)	3565	37.1	5.129	-37.7	22.3	8.7
Down-link	5G NR 30MHz (64QAM)	3625	37.0	4.977	-37.8	22.2	8.7
Down-link	5G NR 30MHz (64QAM)	3685	37.0	5.012	-37.8	22.2	8.9
Down-link	5G NR 30MHz (256QAM)	3565	37.1	5.176	-37.6	22.4	8.7
Down-link	5G NR 30MHz (256QAM)	3625	37.0	5.000	-37.8	22.2	8.6

Test data							
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	PSD (dBm/Hz)	PSD (dBm/MHz)	PAR (dB)
Down-link	5G NR 30MHz (256QAM)	3685	37.0	5.023	-37.8	22.2	8.9
Down-link	5G NR 40MHz (QPSK)	3570	37.2	5.188	-38.9	21.1	9.2
Down-link	5G NR 40MHz (QPSK)	3625	37.0	5.047	-39.0	21.0	8.7
Down-link	5G NR 40MHz (QPSK)	3680	37.0	5.035	-39.0	21.0	9.2
Down-link	5G NR 40MHz (16QAM)	3570	37.2	5.212	-38.9	21.2	9.2
Down-link	5G NR 40MHz (16QAM)	3625	37.1	5.105	-38.9	21.1	8.7
Down-link	5G NR 40MHz (16QAM)	3680	37.0	5.047	-39.0	21.0	9.2
Down-link	5G NR 40MHz (64QAM)	3570	37.1	5.117	-38.9	21.1	9.2
Down-link	5G NR 40MHz (64QAM)	3625	37.0	5.058	-39.0	21.0	8.7
Down-link	5G NR 40MHz (64QAM)	3680	37.0	4.977	-39.1	21.0	9.2
Down-link	5G NR 40MHz (256QAM)	3570	37.1	5.105	-38.9	21.1	9.2
Down-link	5G NR 40MHz (256QAM)	3625	37.1	5.105	-39.0	21.1	8.7
Down-link	5G NR 40MHz (256QAM)	3680	37.0	4.989	-39.0	21.0	9.2
Down-link	5G NR 50MHz (QPSK)	3575	37.0	5.000	-40.0	20.0	9.0
Down-link	5G NR 50MHz (QPSK)	3625	37.1	5.164	-39.9	20.1	8.7
Down-link	5G NR 50MHz (QPSK)	3675	37.0	4.977	-40.0	20.0	9.3
Down-link	5G NR 50MHz (16QAM)	3575	37.1	5.140	-39.9	20.1	9.0
Down-link	5G NR 50MHz (16QAM)	3625	37.0	5.023	-40.0	20.0	8.7
Down-link	5G NR 50MHz (16QAM)	3675	37.0	4.977	-40.0	20.0	9.3
Down-link	5G NR 50MHz (64QAM)	3575	37.0	5.012	-40.0	20.0	9.0
Down-link	5G NR 50MHz (64QAM)	3625	37.1	5.140	-39.9	20.1	8.7
Down-link	5G NR 50MHz (64QAM)	3675	37.0	4.966	-40.0	20.0	9.3
Down-link	5G NR 50MHz (256QAM)	3575	37.1	5.129	-39.9	20.1	9.0
Down-link	5G NR 50MHz (256QAM)	3625	37.0	5.023	-40.0	20.0	8.7

Test data							
Direction	Modulation	Frequency (MHz)	RF output Power (dBm)	RF output channel Power (W)	PSD (dBm/Hz)	PSD (dBm/MHz)	PAR (dB)
Down-link	5G NR 50MHz (256QAM)	3675	36.9	4.943	-40.1	20.0	9.3
Down-link	5G NR 60MHz (QPSK)	3580	37.0	5.012	-40.8	19.2	9.1
Down-link	5G NR 60MHz (QPSK)	3625	37.0	5.047	-40.8	19.3	8.8
Down-link	5G NR 60MHz (QPSK)	3670	37.2	5.212	-40.6	19.4	9.0
Down-link	5G NR 60MHz (16QAM)	3580	37.0	5.035	-40.8	19.2	9.1
Down-link	5G NR 60MHz (16QAM)	3625	37.1	5.129	-40.7	19.3	8.8
Down-link	5G NR 60MHz (16QAM)	3670	37.1	5.176	-40.6	19.4	9.0
Down-link	5G NR 60MHz (64QAM)	3580	37.0	5.023	-40.8	19.2	9.1
Down-link	5G NR 60MHz (64QAM)	3625	37.0	5.058	-40.7	19.3	8.8
Down-link	5G NR 60MHz (64QAM)	3670	37.1	5.140	-40.7	19.3	9.0
Down-link	5G NR 60MHz (256QAM)	3580	37.0	4.977	-40.8	19.2	9.1
Down-link	5G NR 60MHz (256QAM)	3625	37.1	5.117	-40.7	19.3	8.8
Down-link	5G NR 60MHz (256QAM)	3670	37.2	5.200	-40.7	19.3	9.0

Special notes

Remark: MIMO application where only cross-polarized antennas are allowed (KDB "662911 D01 Multiple Transmitter Output v02r01", chapter F, paragraph 2), letter c), item (i)).

Please note that the case with cross-polarized antennas (the only allowed, as stated in the User Manual), with a pair of antennas ($N_{ANT} = 2$) and two outputs ports driving the antennas, has been considered as worst case; therefore the directional gain is the gain of an individual antenna.

Compliance to Category A limits

Maximum EIRP ≤ 30 dBm/10MHz

Maximum PSD eirp ≤ 20 dBm/1MHz

5 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 30.0 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-30.0+N) = N - 10.0$ dBi

10 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 27.2 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-27.2+N) = N - 7.2$ dBi

15 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 25.3 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-25.3+N) = N - 5.3$ dBi

20 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 24.2 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-24.2+N) = N - 4.2$ dBi

25 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 23.2 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-23.2+N) = N - 3.2$ dBi

30 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 22.4 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-22.4+N) = N - 2.4$ dBi

40 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 21.2 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-21.2+N) = N - 1.2$ dBi

50 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 20.1 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-20.1+N) = N - 0.1$ dBi

60 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 19.4 - N + G_{max} \leq 20$

The allowed max antenna gain is calculated as: $G_{max} \leq (20-19.4+N) = N + 0.6$ dBi

Compliance to Category B limits

Maximum EIRP ≤ 47 dBm/10MHz

Maximum PSD eirp ≤ 37 dBm/1MHz

5 MHz bandwidth:

PSD eirp (in 1 MHz) = $PSD_{max} - N + G_{max} = 30.0 - N + G_{max} \leq 37$

The allowed max antenna gain is calculated as: $G_{max} \leq (37-30.0+N) = N + 7.0$ dBi

10 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 27.2 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37 - 27.2 + N) = N + 9.8 \text{ dBi}$

15 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 25.3 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37 - 25.3 + N) = N + 11.7 \text{ dBi}$

20 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 24.2 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37 - 24.2 + N) = N + 12.8 \text{ dBi}$

25 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 23.2 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37 - 23.2 + N) = N + 13.8 \text{ dBi}$

30 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 22.4 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37 - 22.4 + N) = N + 14.6 \text{ dBi}$

40 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 21.2 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37 - 21.2 + N) = N + 15.8 \text{ dBi}$

50 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 20.1 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37 - 20.1 + N) = N + 16.9 \text{ dBi}$

60 MHz bandwidth:

$$\text{PSD eirp (in 1 MHz)} = \text{PSD}_{\text{max}} - N + G_{\text{max}} = 19.4 - N + G_{\text{max}} \leq 37$$

The allowed max antenna gain is calculated as: $G_{\text{max}} \leq (37 - 19.4 + N) = N + 17.6 \text{ dBi}$

Where:

- PSD_{max} is the maximum PSD value measured on the antenna connector of the equipment and it depends on the LTE bandwidth signal
- N is system path loss (in dB) due to cable insertion, splitter, etc....
- G_{max} is the maximum antenna gain (in dBi)

RF PORT 2 PLOT

