



Wupatec

DPD IP core

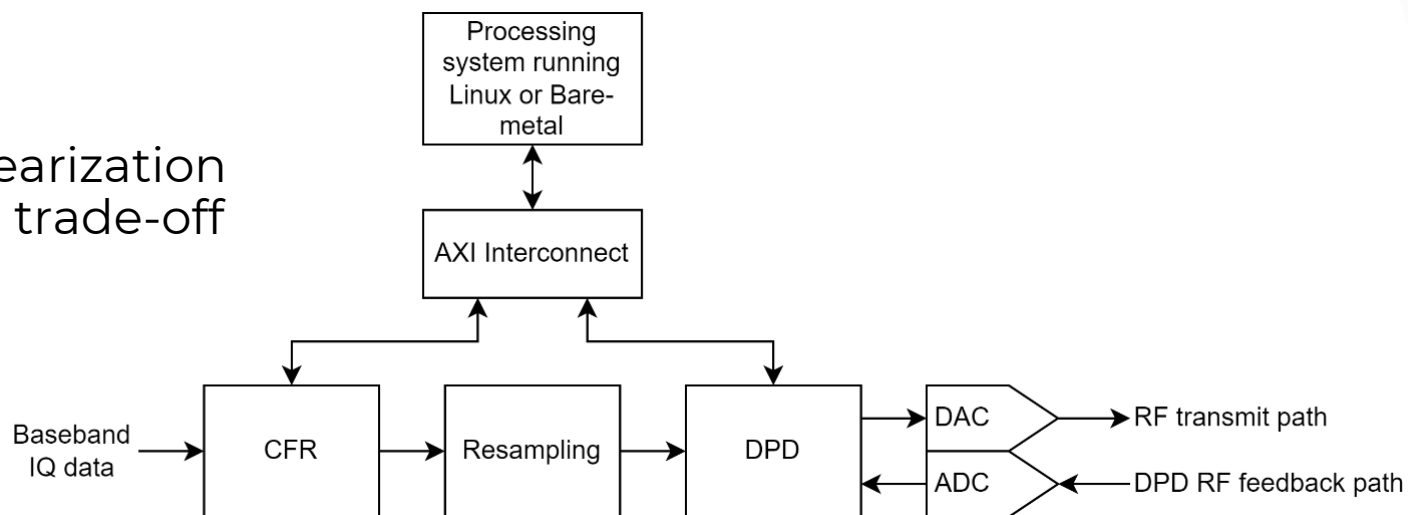
DPD performance evaluation

| Date : 9th September, 2026

Wupatec DPD IP core

Features summary

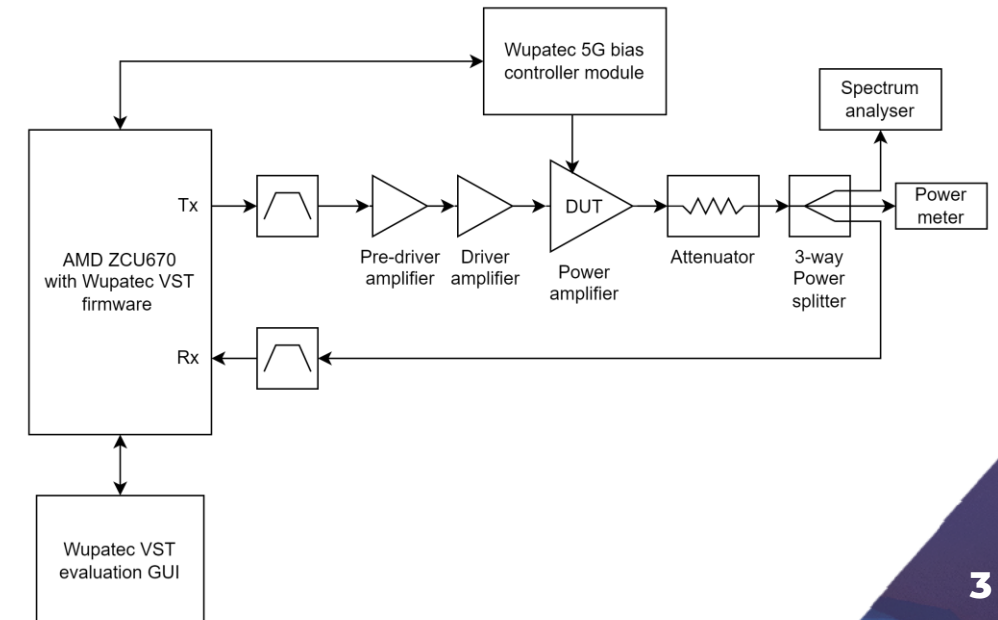
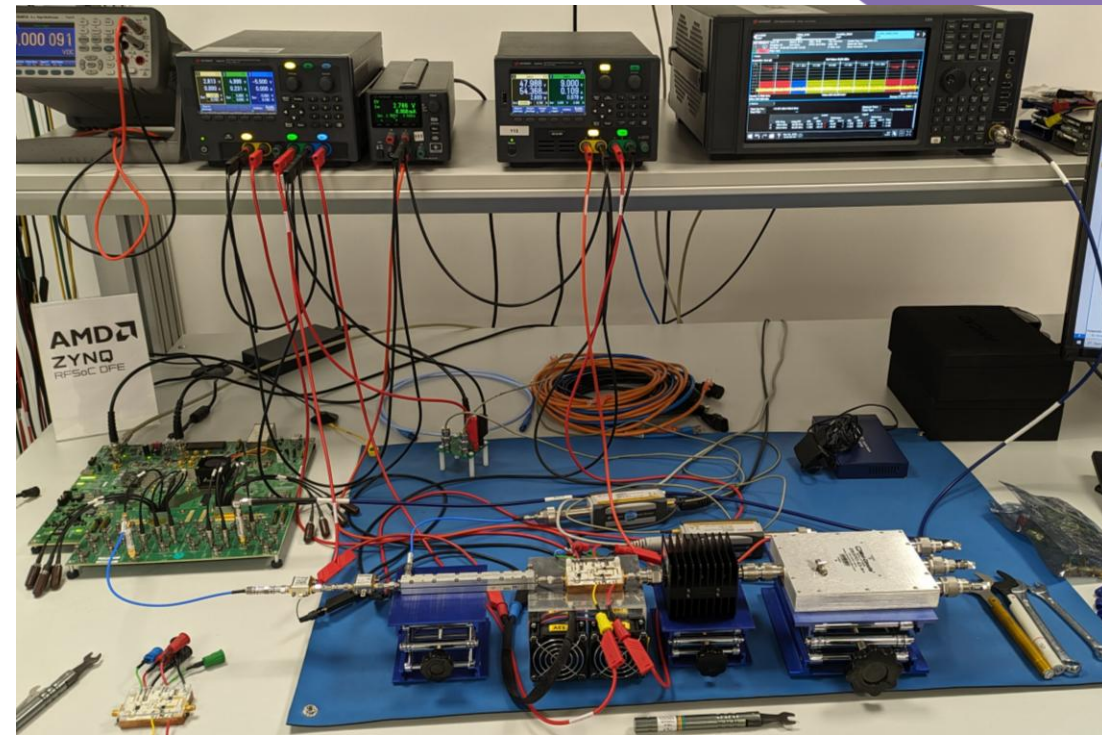
- Complete, integrated and flexible solution
 - IP core integrated in Vivado IP design flow
 - Software C API with support for Linux or Bare-metal running on Zynq PS or MicroBlaze soft core processor
- Support for high iBW, above 1600 MHz
- Customizable model complexity for linearization performance, iBW and FPGA resources trade-off
- Supported device family
 - AMD Zynq UltraScale+ RFSoc
 - AMD Zynq UltraScale+
 - AMD UltraScale/UltraScale+ FPGAs



DPD IP core test setup

Test performed with [Wupatec PA test solution](#) based on the AMD RFSoc ZCU670 evaluation board.

- Wupatec VST firmware version 0.98
 - Embedded Wupatec DPD version 1.0
- Wupatec 5G Bias controller module used for DUT gate control in TDD use cases
- ZCU670 DAC/ADC configuration
 - Sampling rate: optimally set by Wupatec VST firmware
 - DAC 227 channel 0 connected to high frequency range balun (4-5GHz) on AMD XM755 board
 - ADC 226 channel 0/1 connected to high frequency range balun (4-5GHz) on AMD XM755 board
 - Bandpass filter: VBFZ-3590-S+ (3-4.3GHz)
- Spectrum analyser / VSA used for performance validation
 - Keysight CX N9000B
 - R&S FSW43 with 5G-NR downlink measurements option



DPD performance summary

DUT	Center freq. (MHz)	Test signal	iBW (MHz)	Carrier config.	Power (dBm)	PAPR (dB)	ACPR with DPD (dBc)		ACPR without DPD (dBc)		EVM with DPD (%)	EVM without DPD (%)
Wupatec WPA- 3342G-55	3800	TM3.1a FDD	100	1*NR100	39.5	8	-55.3	-55.0	-36.0	-36.3	1.82	3.11
			400	2*NR100			-50.3	-49.4	-37.9	-39.2	2.42	3.4
			400	4*NR100			-47.7	-47.0	-34.9	-35.5	2.11	3.56
Ampleon BLM10D3 438-35AB	3600	TM3.1a FDD	20	1*NR20	37		-54.0	-54.0	-21.5	-31.6	1.74	6.1
			100	1*NR100			-49.4	-50.9	-31.2	-31.1	1.87	6.02
		TM3.1a TDD	100	1*NR100			-49.0	-50.5	-30.7	-30.5	1.95	6.14
NXP A3M36SL 039	3600	TM3.1a FDD	20	1*NR20	39.5		-48.5	-49.0	-29.5	-30.3	1.77	5.02
			100	1*NR100			-48.8	-49.7	-29.2	-31.0	1.8	4.85
		TM3.1a TDD	100	1*NR100			-48.1	-49.3	-28.9	-30.4	1.91	5.02

Wupatec WPA-3342G-55 amplifier details

- 2-stage GaN Doherty PA
- Operating frequency range: 3.3 – 4.2 GHz
- Peak output power: 47.5 dBm
- Gain: 29 dB
- Efficiency: 36.5% @ 8 dB Output Back Off

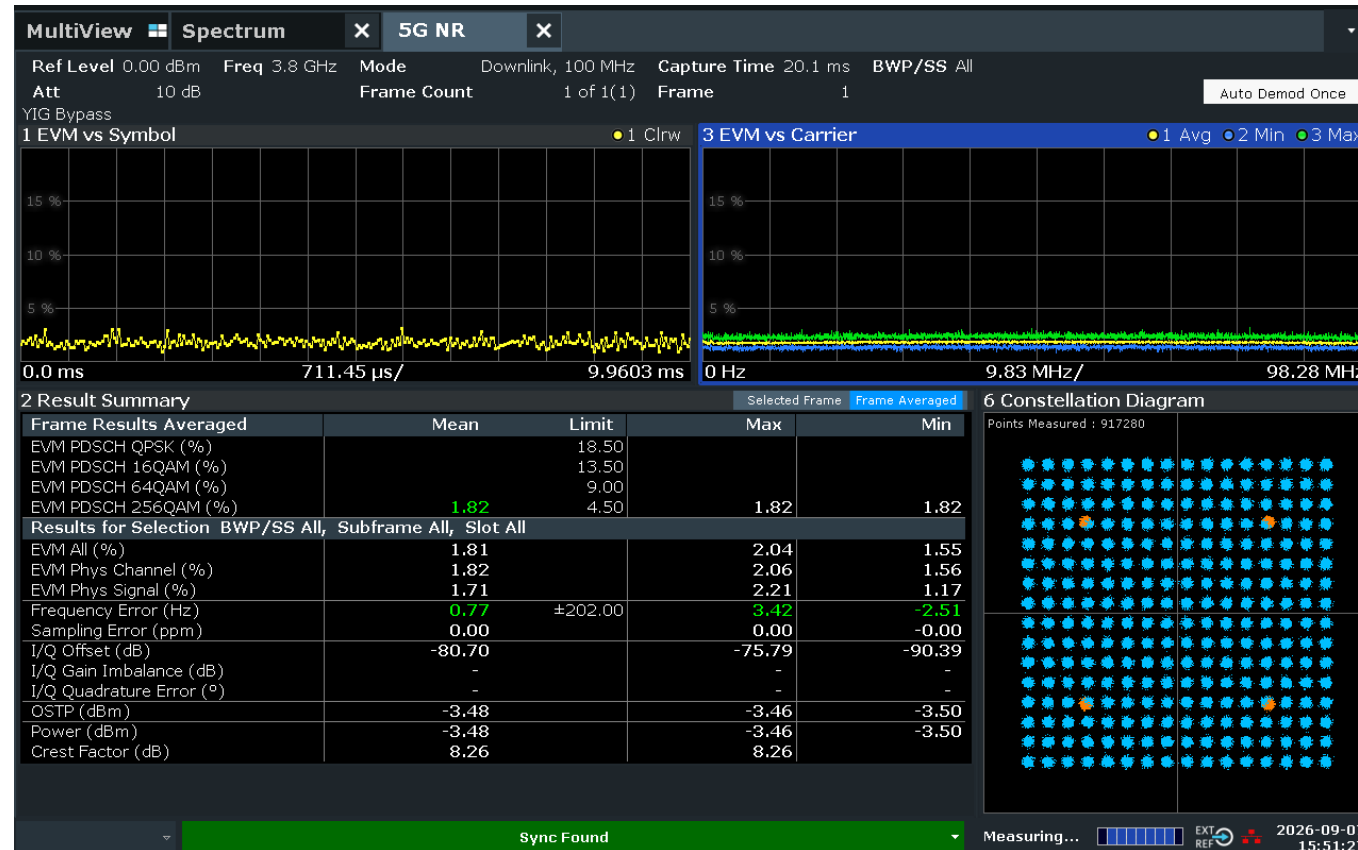
WPA-3342G-55 test results: case 1

EVM performance – without DPD



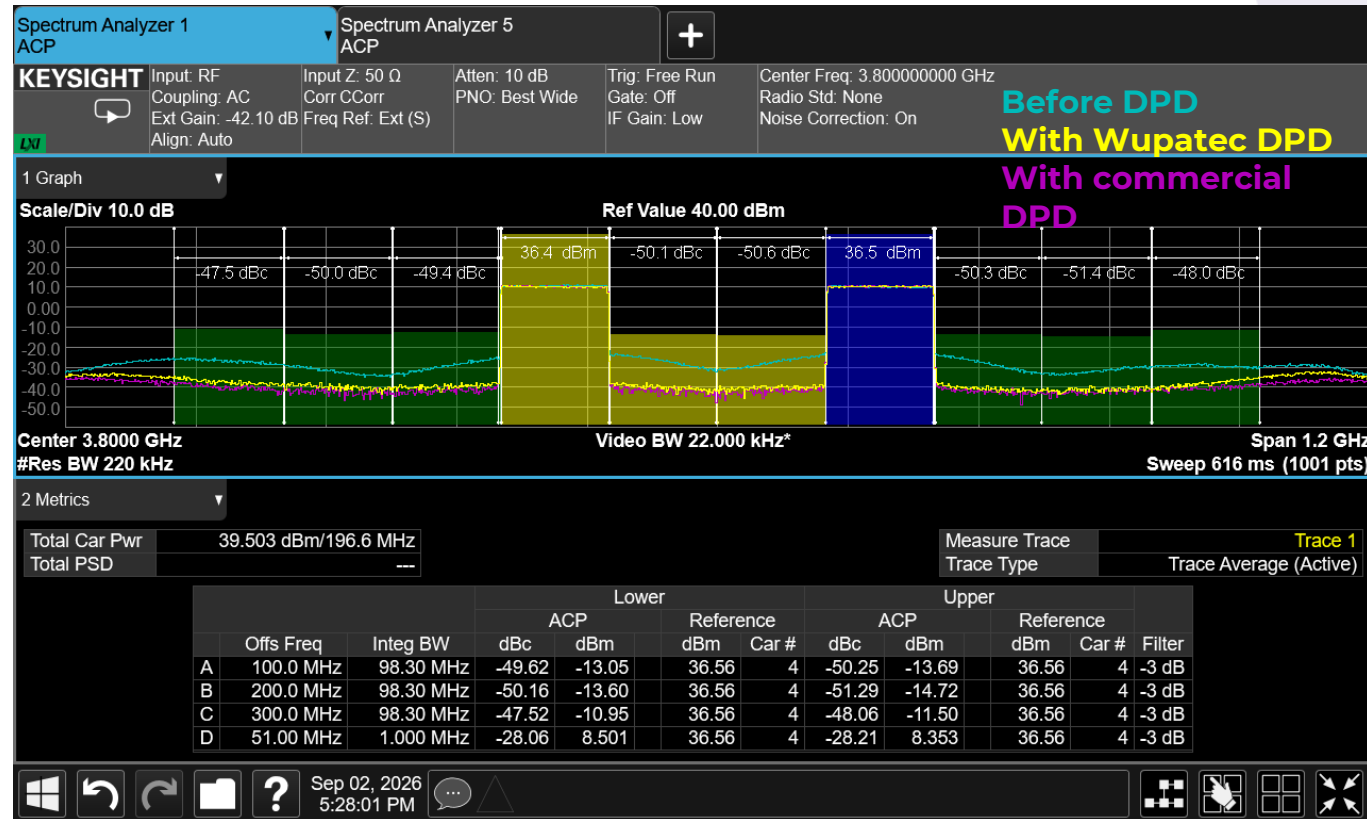
WPA-3342G-55 test results: case 1

EVM performance – with Wupatec DPD



WPA-3342G-55 test results: case 2

- Center frequency: 3800 MHz
- 5GNR TM3.1a FDD
- 2*NR100, 400MHz iBW
- PAPR @ 0.01%: 8.05dB
- DPD sampling rate: 1474.56 MS/s
- EVM after CFR: 2.33 %



Description	PA output power	ACPR 1 Upper	ACPR 1 Lower	ACPR 2 Upper	ACPR 2 Lower	EVM RMS
Without DPD	39.5 dBm	-37.9 dBc	-39.2 dBc	-42.2 dBc	-42.3 dBc	3.4 %
With commercial DPD	39.5 dBm	-51.6 dBc	-51.3 dBc	-52.5 dBc	-52.4 dBc	2.47 %
With Wupatec DPD	39.5 dBm	-50.3 dBc	-49.4 dBc	-51.4 dBc	-50.0 dBc	2.42 %

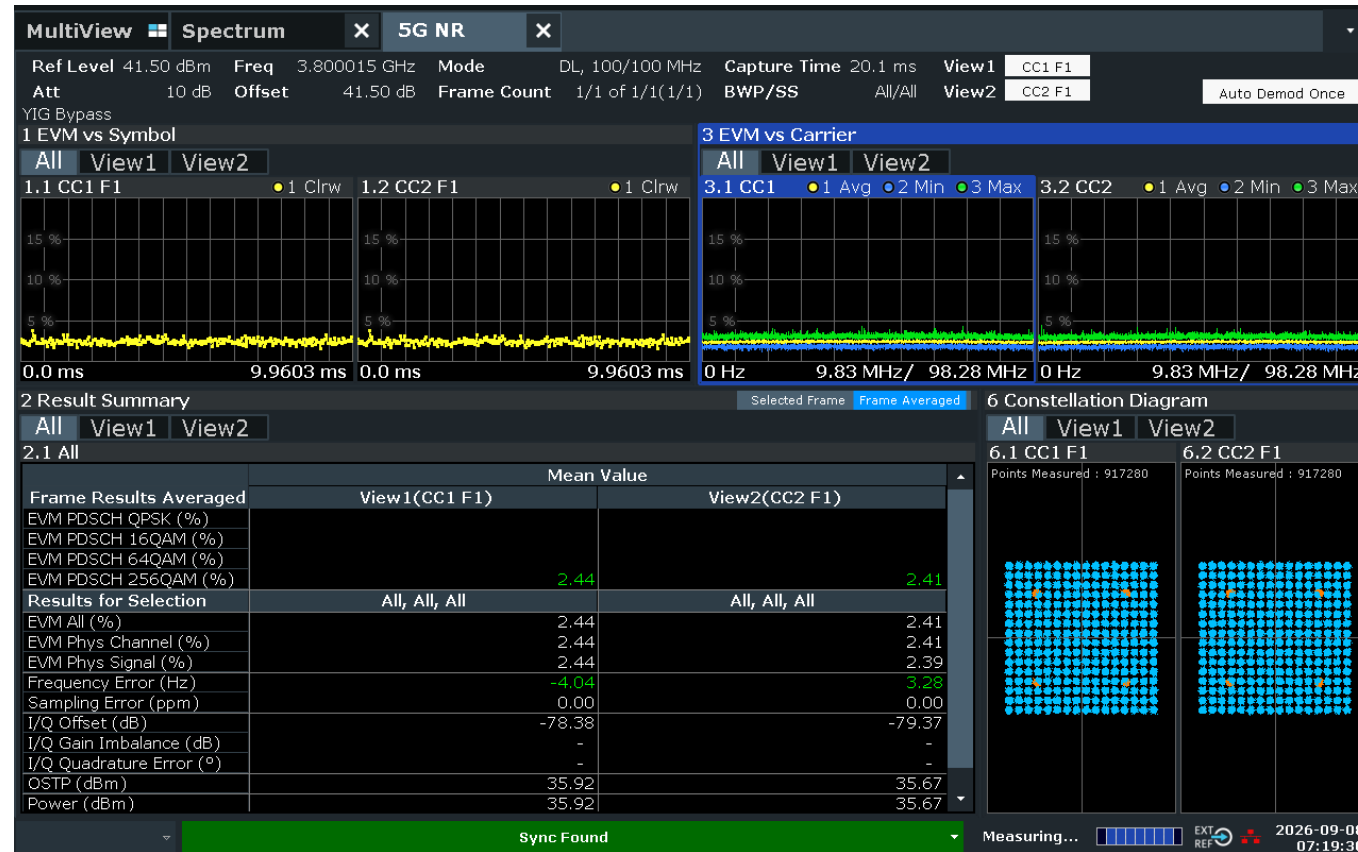
WPA-3342G-55 test results: case 2

EVM performance – without DPD



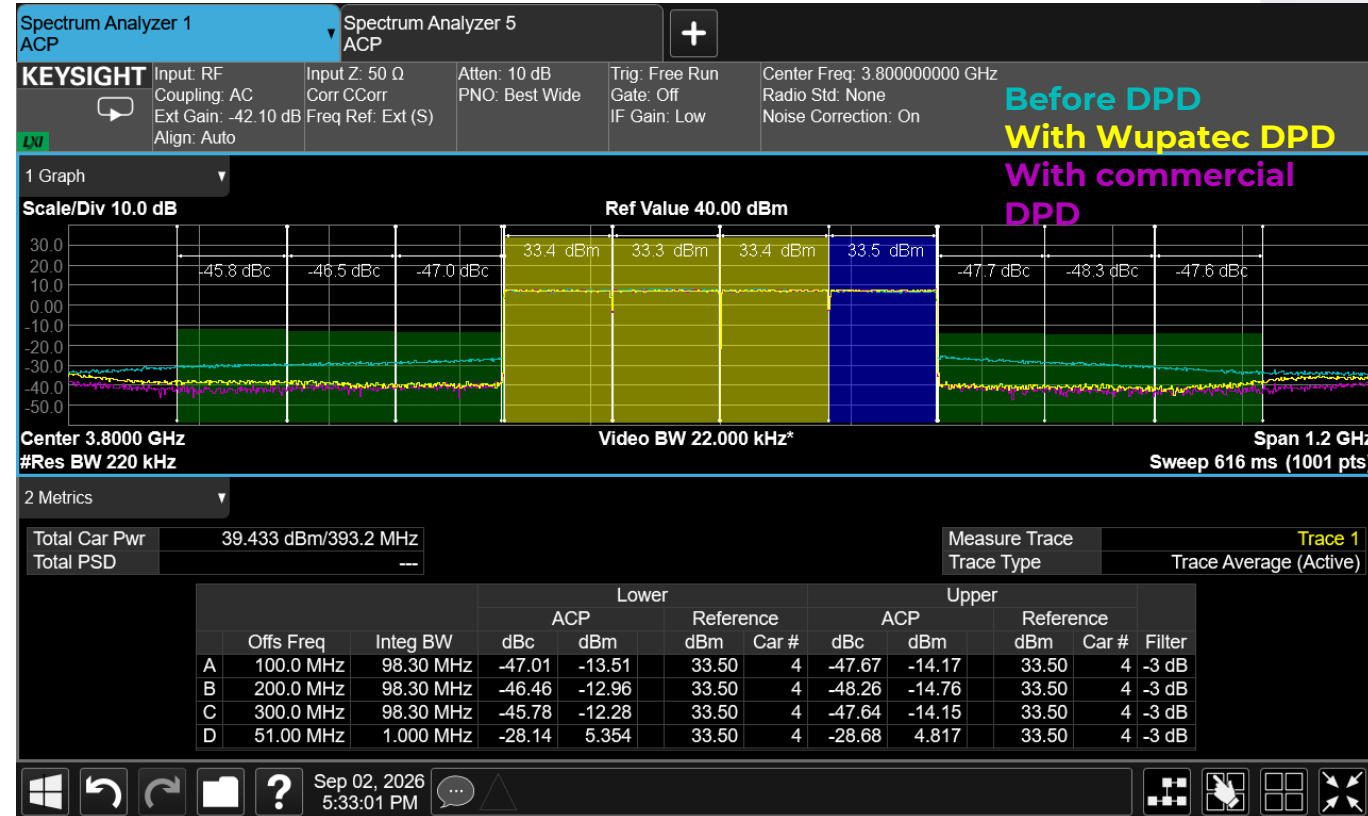
WPA-3342G-55 test results: case 2

EVM performance – with Wupatec DPD



WPA-3342G-55 test results: case 3

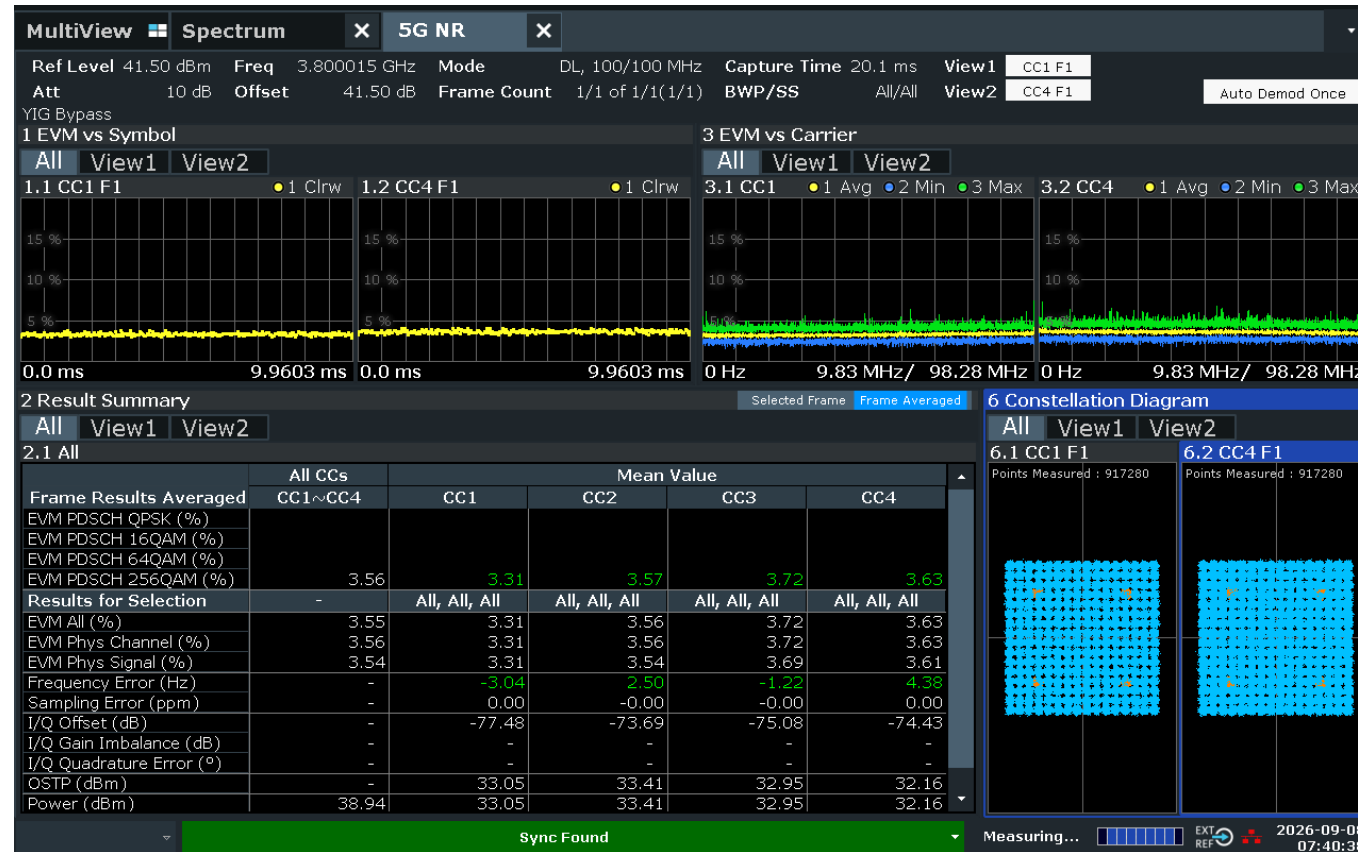
- Center frequency: 3800 MHz
- 5GNR TM3.1a FDD
- 4*NR100, 400MHz iBW
- PAPR @ 0.01%: 8.05dB
- DPD sampling rate: 1474.56 MS/s
- EVM after CFR: 1.8 %



Description	PA output power	ACPR 1 Upper	ACPR 1 Lower	ACPR 2 Upper	ACPR 2 Lower	EVM RMS
Without DPD	39.5 dBm	-37.9 dBc	-39.2 dBc	-42.2 dBc	-42.3 dBc	3.4 %
With commercial DPD	39.5 dBm	-51.6 dBc	-51.3 dBc	-52.5 dBc	-52.4 dBc	2.47 %
With Wupatec DPD	39.5 dBm	-50.3 dBc	-49.4 dBc	-51.4 dBc	-50.0 dBc	2.42 %

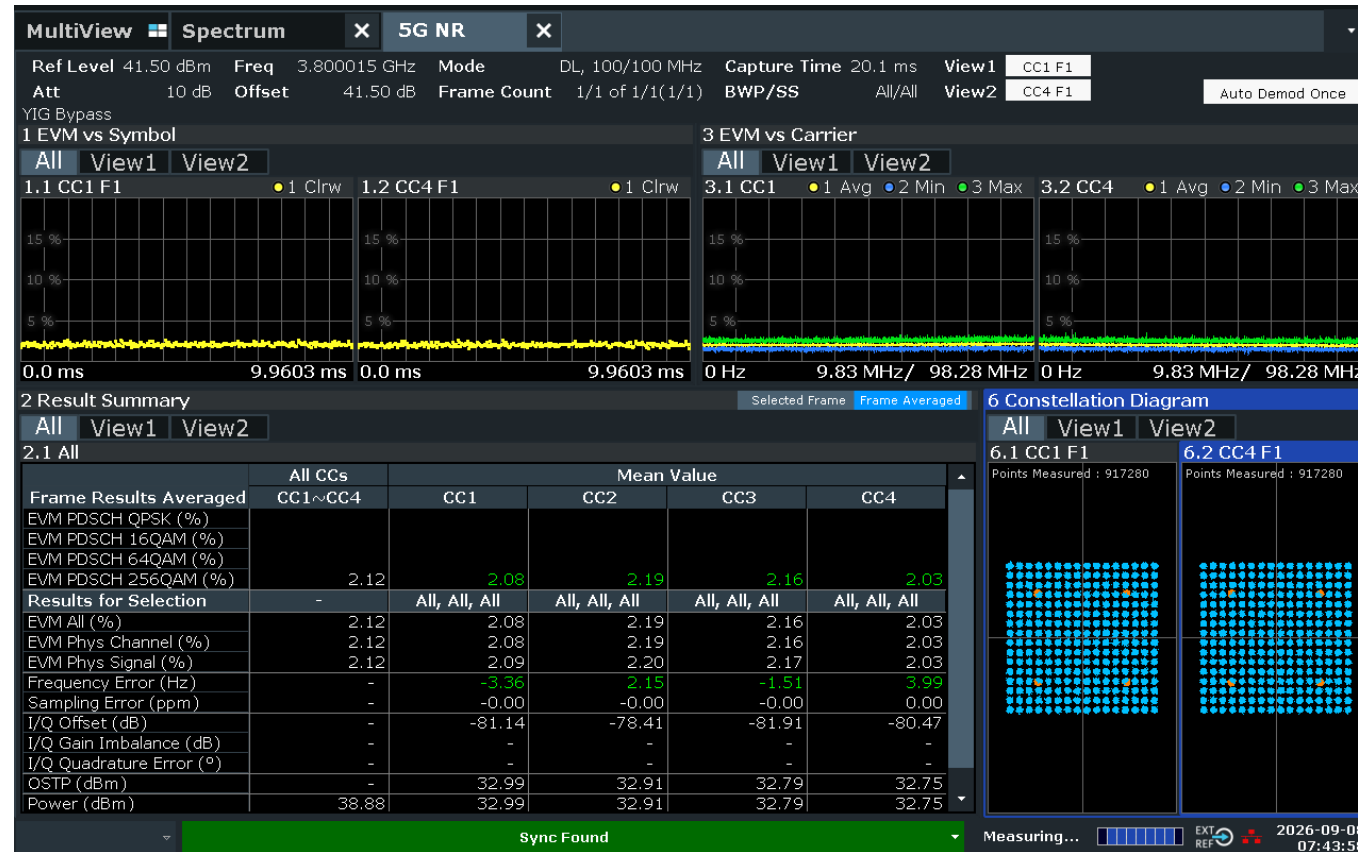
WPA-3342G-55 test results: case 3

EVM performance – without DPD



WPA-3342G-55 test results: case 3

EVM performance – with Wupatec DPD

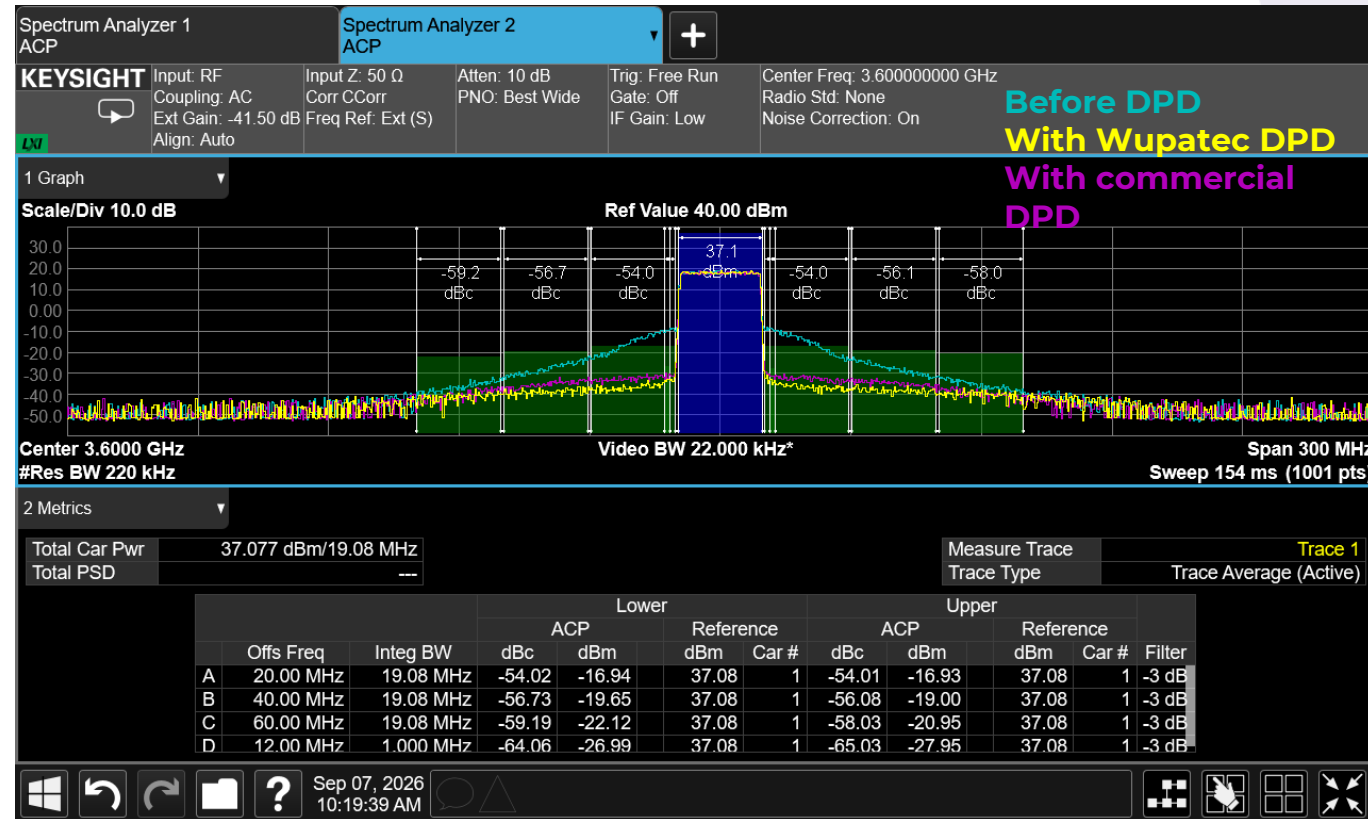


Ampleon BLM10D3438-35AB amplifier details

- 3-stage LDMOS Doherty PA MMIC
- Operating frequency range: 3.4 – 3.8 GHz
- Peak output power: 45.5 dBm
- Gain: 33 dB
- Efficiency: 41% @ 8.5 dB Output Back Off

BLM10D3438-35AB test results: case 1

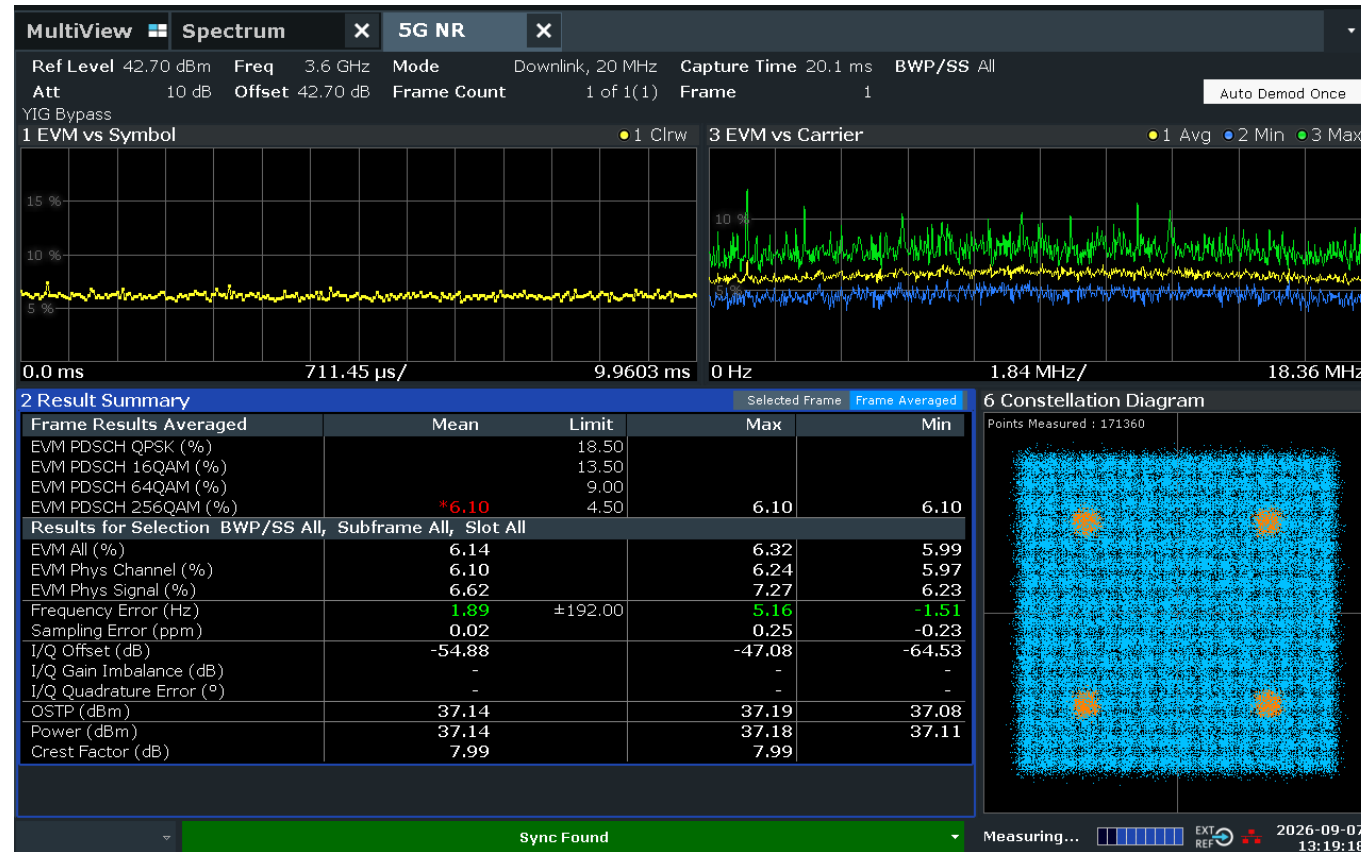
- Center frequency: 3600 MHz
- 5GNR TM3.1a FDD
- 1*NR20, 20MHz iBW
- PAPR @ 0.01%: 8.05dB
- DPD sampling rate: 245.76 MS/s
- EVM after CFR: 1.71 %



Description	PA output power	ACPR 1 Upper	ACPR 1 Lower	ACPR 2 Upper	ACPR 2 Lower	EVM RMS
Without DPD	37 dBm	-21.5 dBc	-31.6 dBc	-45.3 dBc	-45.1 dBc	6.10 %
With commercial DPD	37 dBm	-50.1 dBc	-50.4 dBc	-52.5 dBc	-53 dBc	1.88 %
With Wupatec DPD	37 dBm	-54.0 dBc	-54.0 dBc	-56.1 dBc	-56.7 dBc	1.74 %

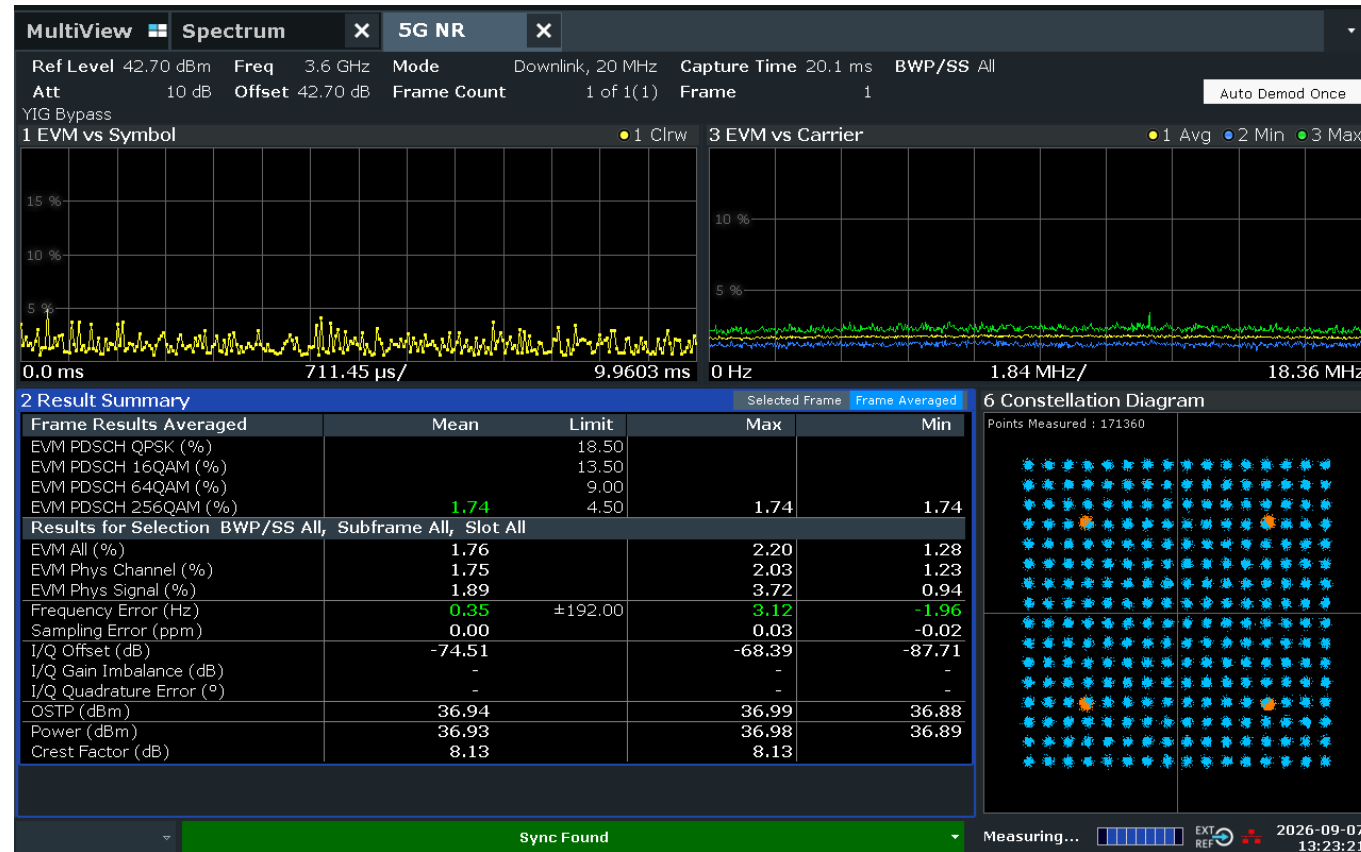
BLM10D3438-35AB test results: case 1

EVM performance – without DPD



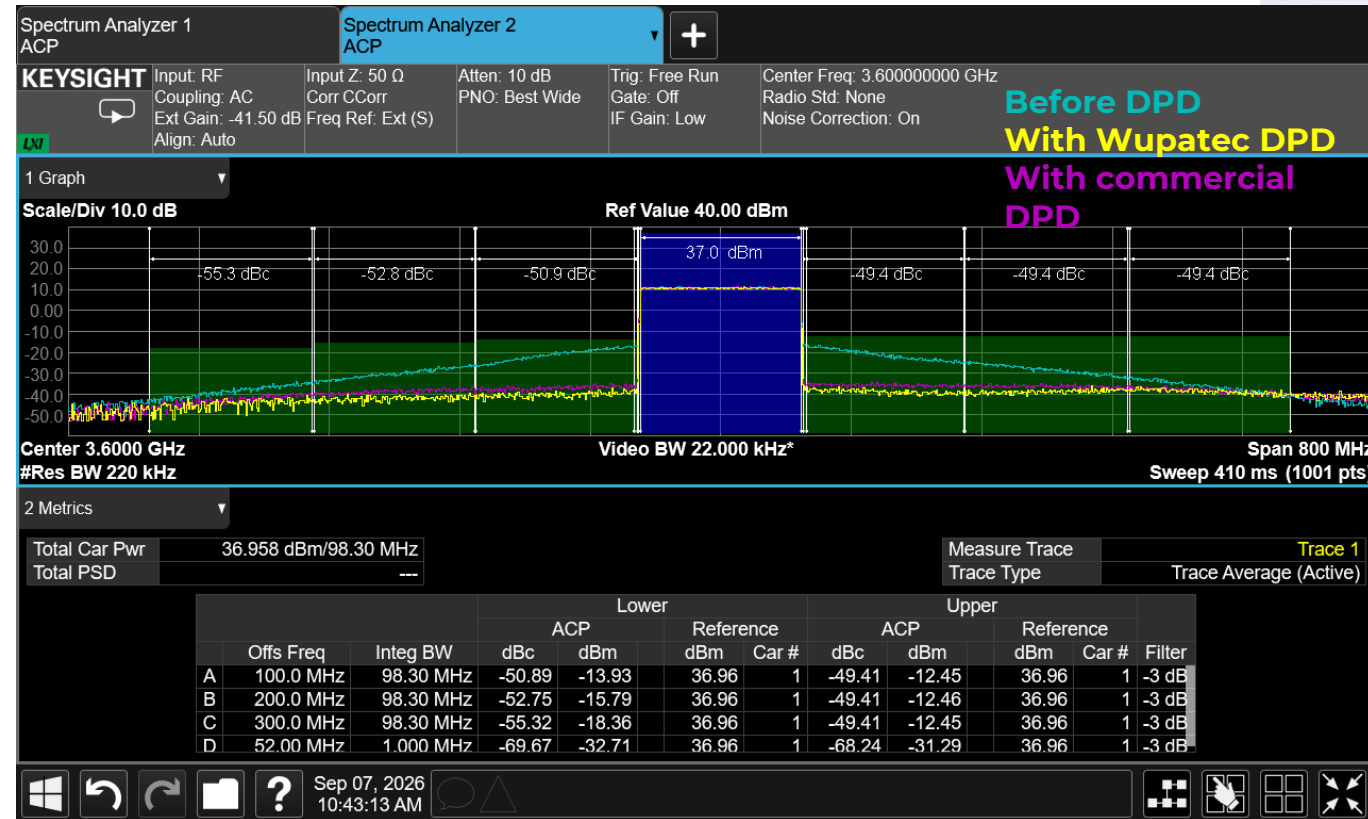
BLM10D3438-35AB test results: case 1

EVM performance – with Wupatec DPD



BLM10D3438-35AB test results: case 2

- Center frequency: 3600 MHz
- 5GNR TM3.1a FDD
- 1*NR100, 100MHz iBW
- PAPR @ 0.01%: 8.05dB
- DPD sampling rate: 983.04 MS/s
- EVM after CFR: 1.74 %



Description	PA output power	ACPR 1 Upper	ACPR 1 Lower	ACPR 2 Upper	ACPR 2 Lower	EVM RMS
Without DPD	37 dBm	-31.2 dBc	-31.1 dBc	-38.6 dBc	-40.5 dBc	6.02 %
With commercial DPD	37 dBm	-46.6 dBc	-47.8 dBc	-47.2 dBc	-49.6 dBc	1.97 %
With Wupatec DPD	37 dBm	-49.4 dBc	-50.9 dBc	-49.4 dBc	-52.8 dBc	1.87 %

BLM10D3438-35AB test results: case 2

EVM performance – without DPD



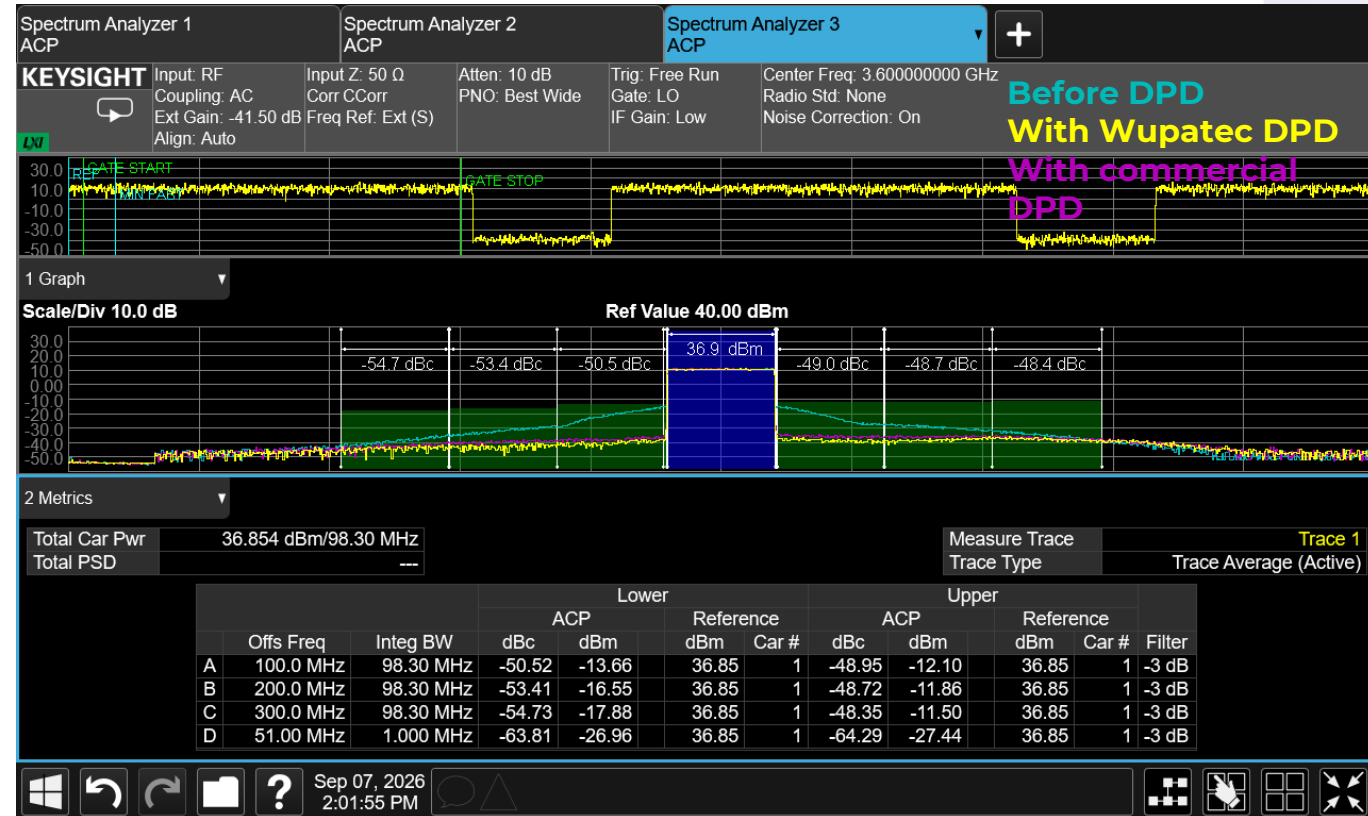
BLM10D3438-35AB test results: case 2

EVM performance – with Wupatec DPD



BLM10D3438-35AB test results: case 3

- Center frequency: 3600 MHz
- 5GNR TM3.1a TDD
- 1*NR100, 100MHz iBW
- PAPR @ 0.01%: 8.05dB
- DPD sampling rate: 983.04 MS/s
- EVM after CFR: 1.84 %



Description	PA output power	ACPR 1 Upper	ACPR 1 Lower	ACPR 2 Upper	ACPR 2 Lower	EVM RMS
Without DPD	37 dBm	-30.7 dBc	-30.5 dBc	-40.0 dBc	-42.2 dBc	6.14 %
With commercial DPD	37 dBm	-46.3 dBc	-48.2 dBc	-46.7 dBc	-50.2 dBc	2.05 %
With Wupatec DPD	37 dBm	-49.0 dBc	-50.5 dBc	-48.7 dBc	-53.4 dBc	1.95 %

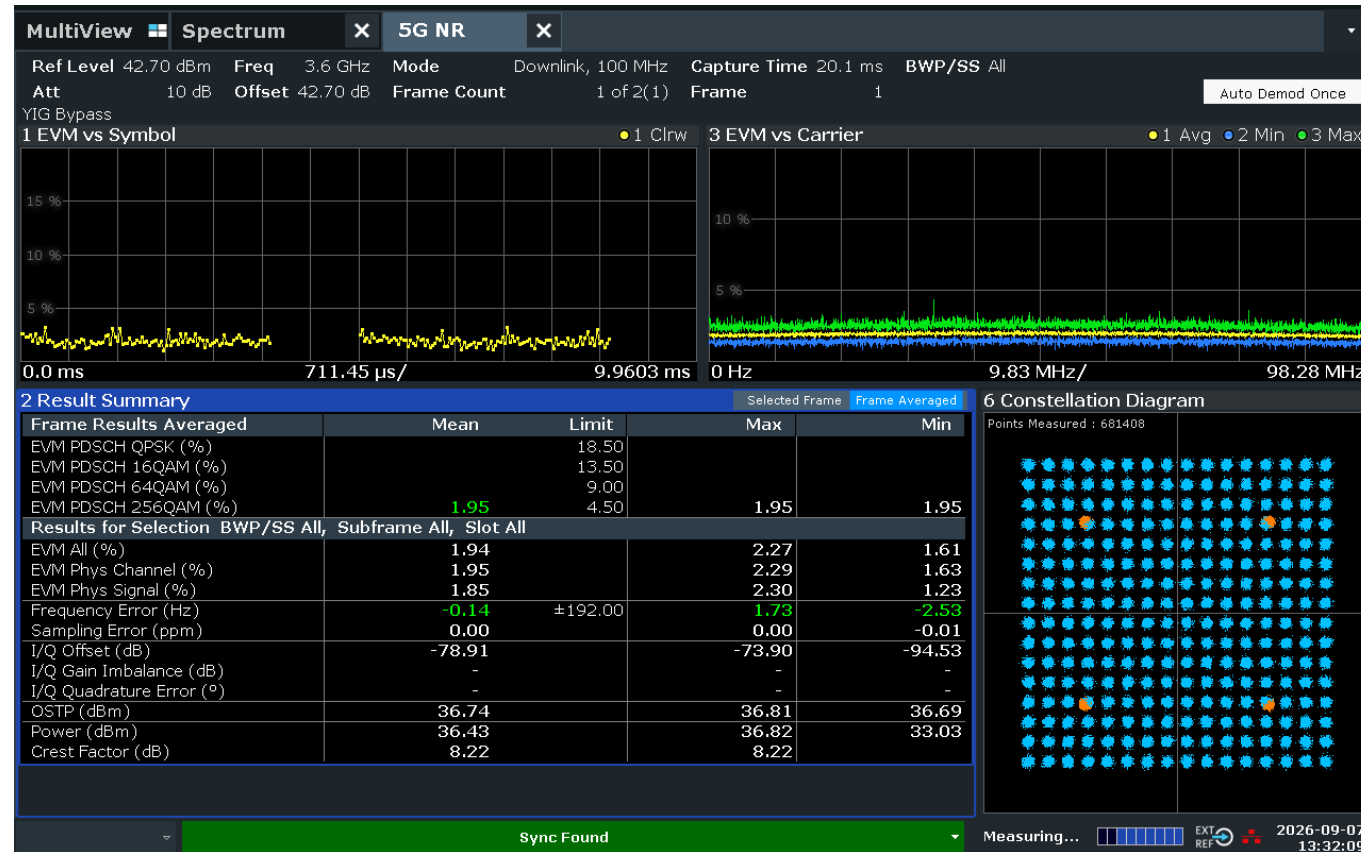
BLM10D3438-35AB test results: case 3

EVM performance – without DPD



BLM10D3438-35AB test results: case 3

EVM performance – with Wupatec DPD



NXP A3M36SL039 amplifier details

- LDMOS Doherty Power Amplifier Module
- Operating frequency range: 3.4 – 3.8 GHz
- Peak output power: 47.5 dBm
- Gain: 29.8 dB
- Efficiency: 38.3% @ 8.5 dB Output Back Off
- Tx Enable control pin for TDD operation

A3M36SL039 test results: case 1

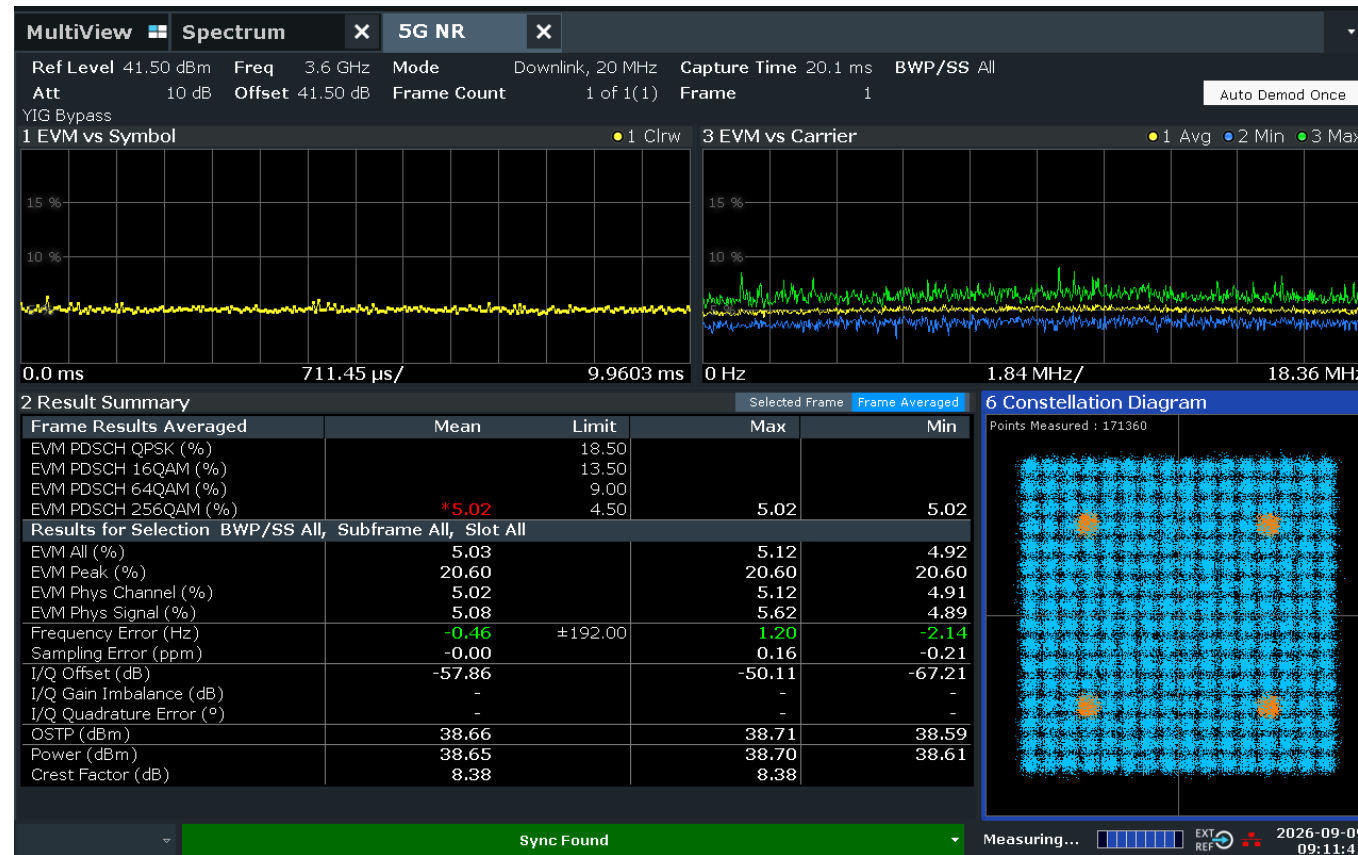
- Center frequency: 3600 MHz
- 5GNR TM3.1a FDD
- 1*NR20, 20MHz iBW
- PAPR @ 0.01%: 8.05dB
- DPD sampling rate: 245.76 MS/s
- EVM after CFR: 1.71 %



Description	PA output power	ACPR 1 Upper	ACPR 1 Lower	ACPR 2 Upper	ACPR 2 Lower	EVM RMS
Without DPD	39.5 dBm	-29.5 dBc	-30.3 dBc	-37.5 dBc	-38.3 dBc	5.02 %
With commercial DPD	39.5 dBm	-45.0 dBc	-45.4 dBc	-45 dBc	-47.7 dBc	1.87 %
With Wupatec DPD	39.5 dBm	-48.5 dBc	-49.0 dBc	-49.9 dBc	-50.8 dBc	1.77 %

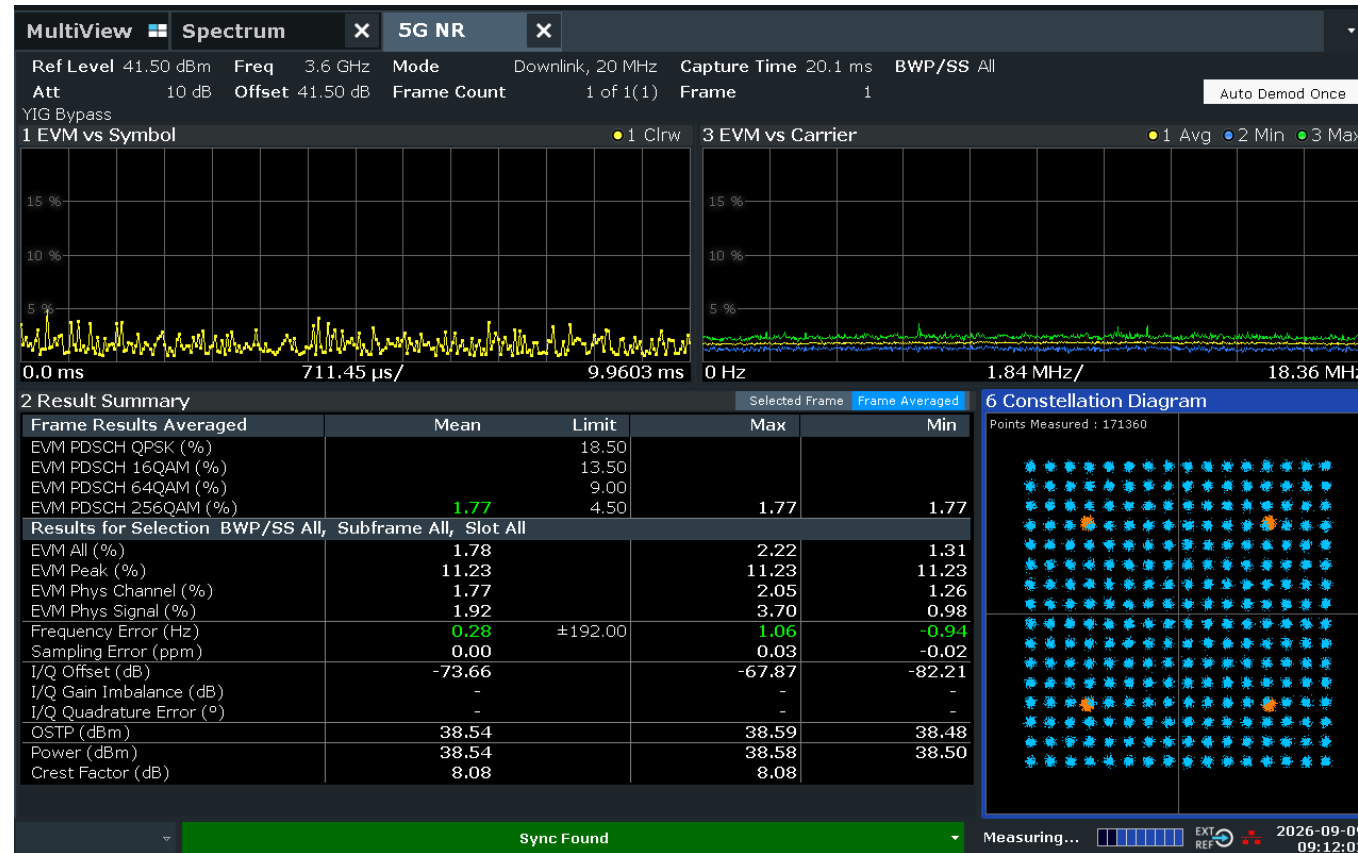
A3M36SL039 test results: case 1

EVM performance – without DPD



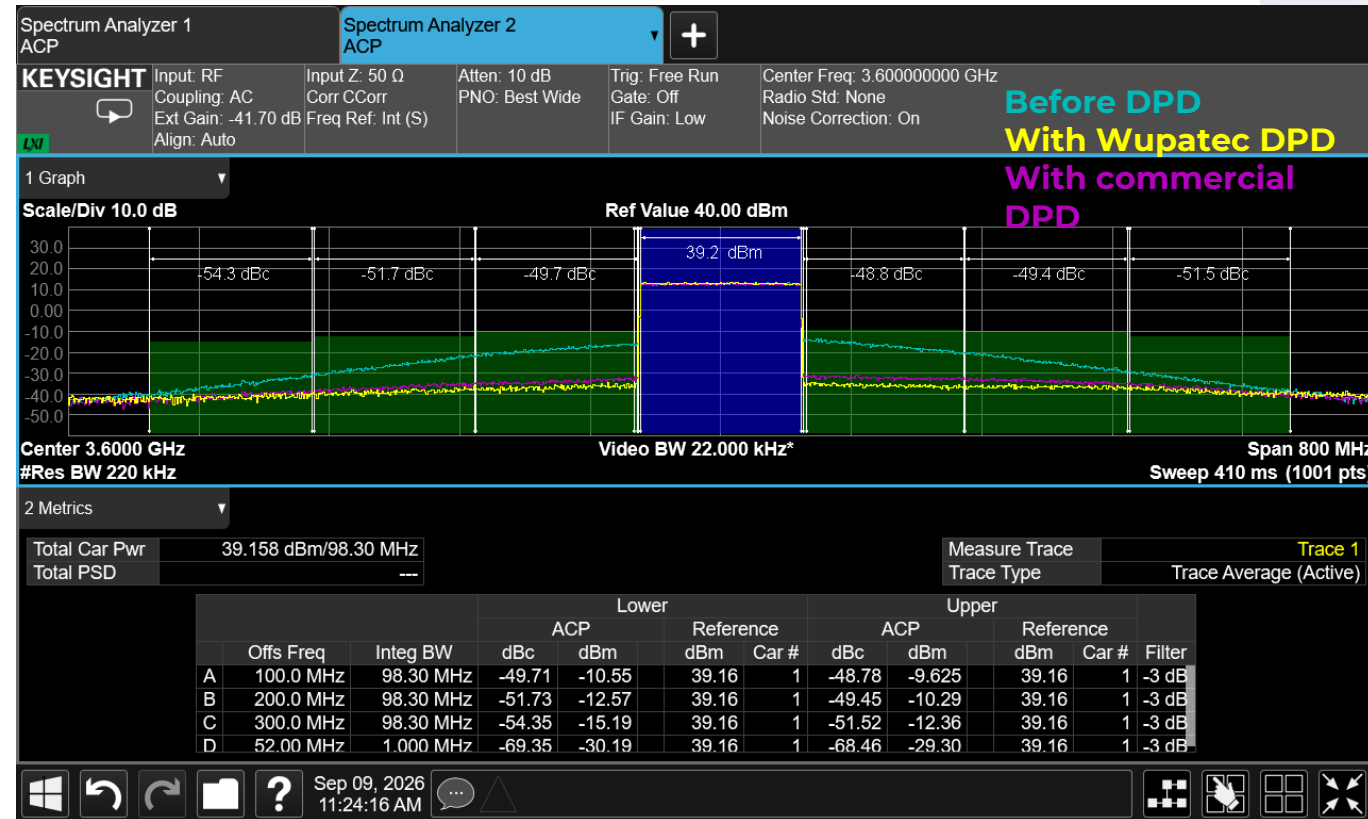
A3M36SL039 test results: case 1

EVM performance – with Wupatec DPD



A3M36SL039 test results: case 2

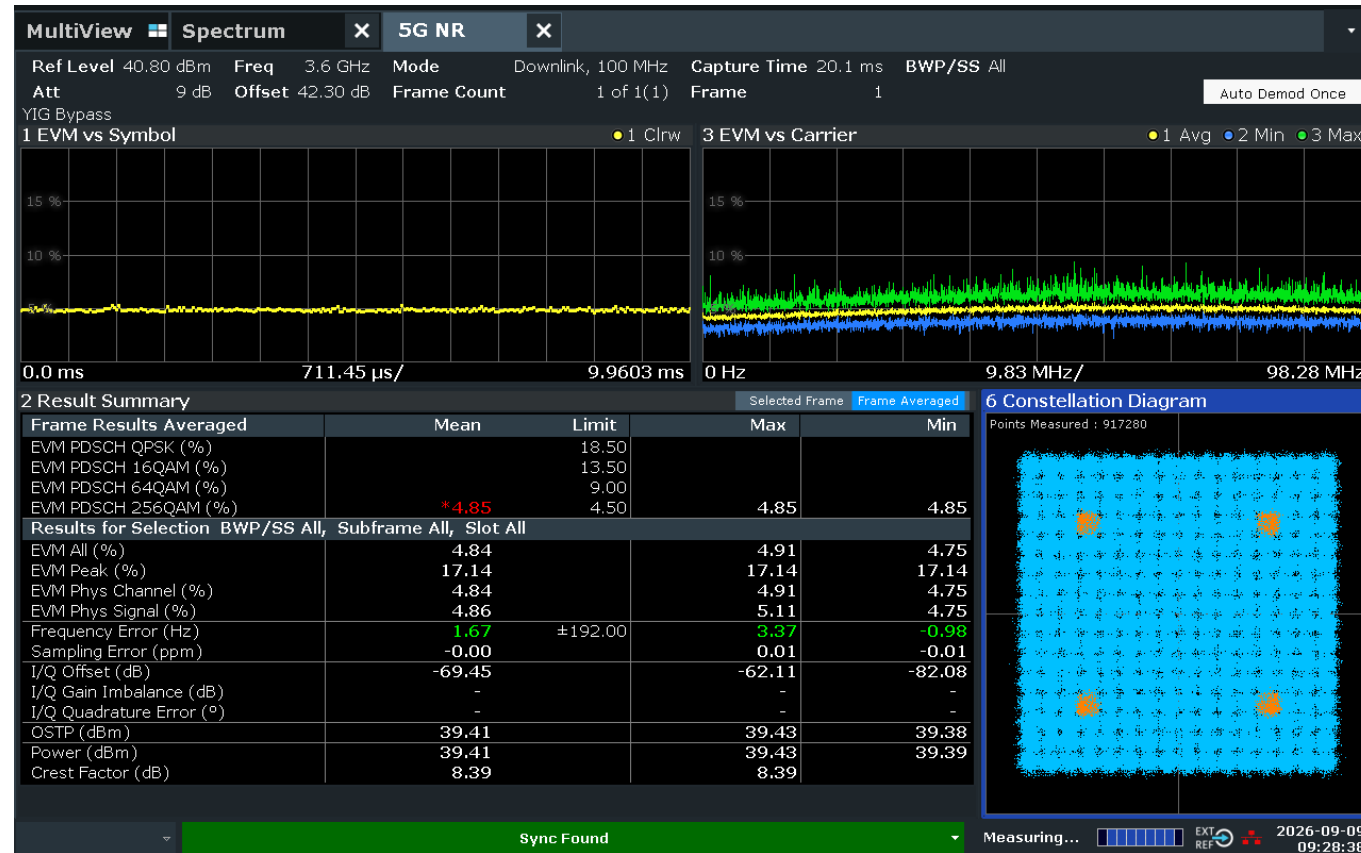
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- 5GNR TM3.1a FDD
- 1*NR100, 100MHz iBW
- PAPR @ 0.01%: 8.05dB
- DPD sampling rate: 983.04 MS/s
- EVM after CFR: 1.74 %



Description	PA output power	ACPR 1 Upper	ACPR 1 Lower	ACPR 2 Upper	ACPR 2 Lower	EVM RMS
Without DPD	39.5 dBm	-29.2 dBc	-31.0 dBc	-36.8 dBc	-38.2 dBc	4.85 %
With commercial DPD	39.5 dBm	-44.9 dBc	-46.5 dBc	-46.4 dBc	-49.3 dBc	1.93 %
With Wupatec DPD	39.5 dBm	-48.8 dBc	-49.7 dBc	-49.4 dBc	-51.7 dBc	1.8 %

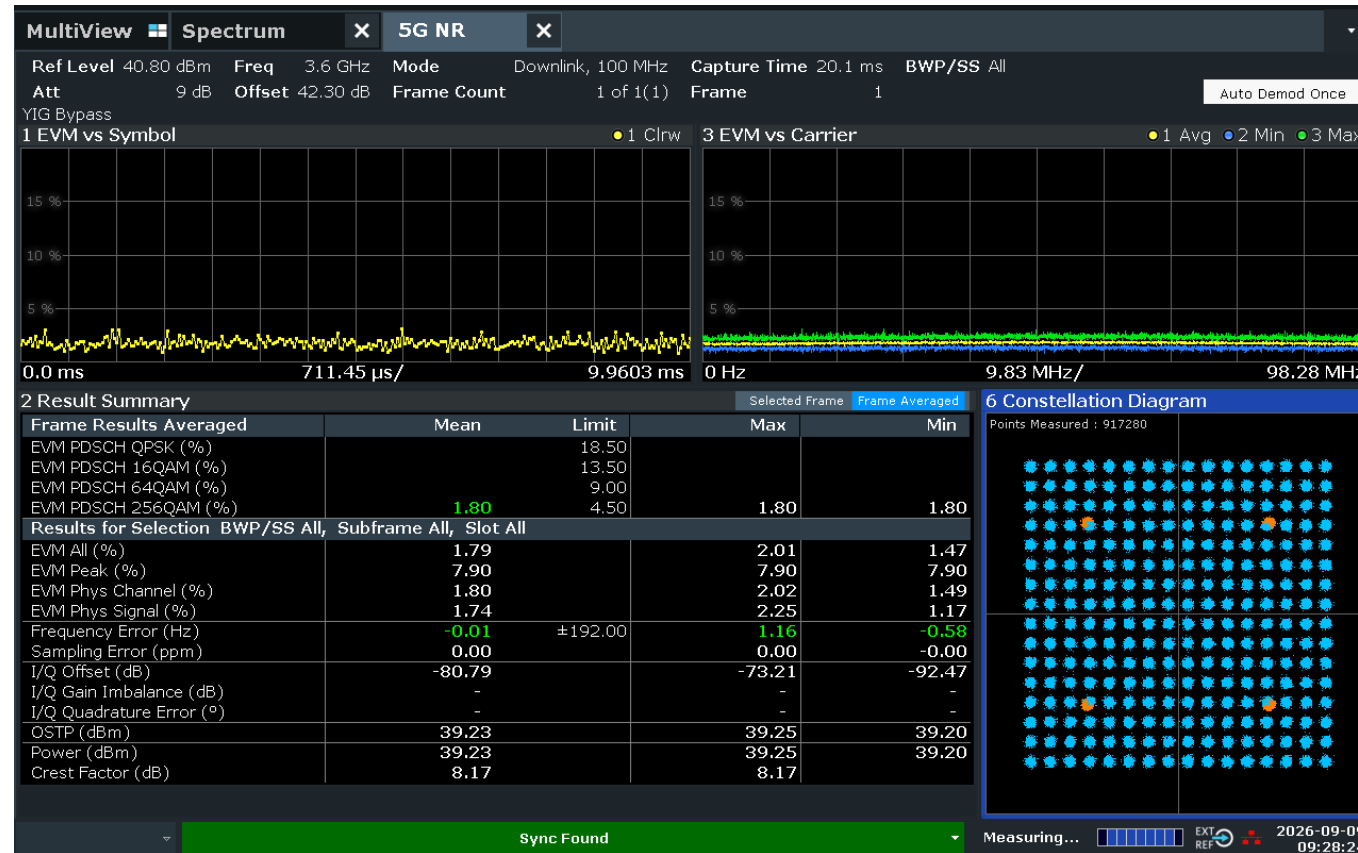
A3M36SL039 test results: case 2

EVM performance – without DPD



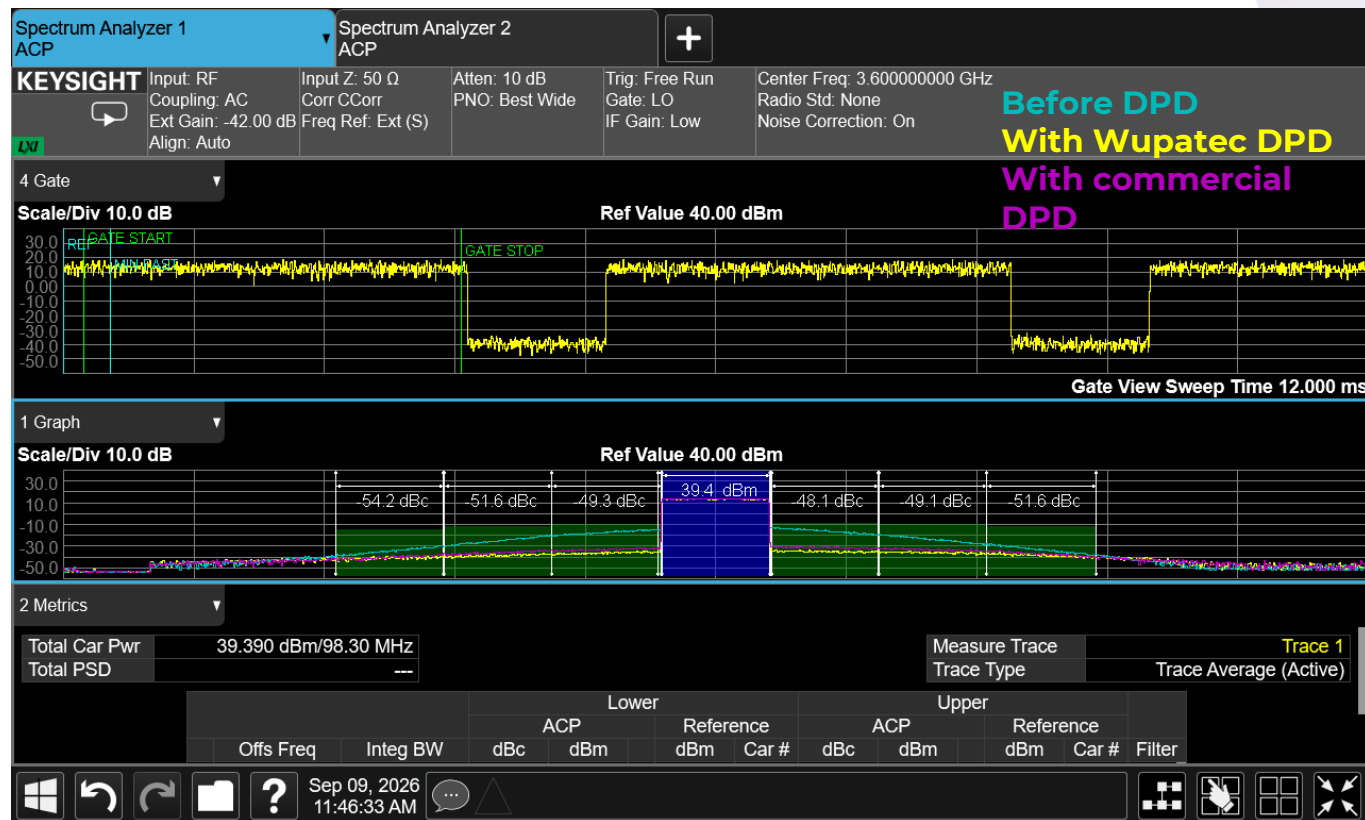
A3M36SL039 test results: case 2

EVM performance – with Wupatec DPD



A3M36SL039 test results: case 3

- Center frequency: 3600 MHz
- 5GNR TM3.1a TDD
- 1*NR100, 100MHz iBW
- PAPR @ 0.01%: 8.05dB
- DPD sampling rate: 983.04 MS/s
- EVM after CFR: 1.84 %



Description	PA output power	ACPR 1 Upper	ACPR 1 Lower	ACPR 2 Upper	ACPR 2 Lower	EVM RMS
Without DPD	39.5 dBm	-28.9 dBc	-30.4 dBc	-36.3 dBc	-37.5 dBc	5.02 %
With commercial DPD	39.5 dBm	-44.7 dBc	-46.3 dBc	-46.5 dBc	-49.1 dBc	2.03 %
With Wupatec DPD	39.5 dBm	-48.1 dBc	-49.3 dBc	-49.1 dBc	-51.6 dBc	1.91 %

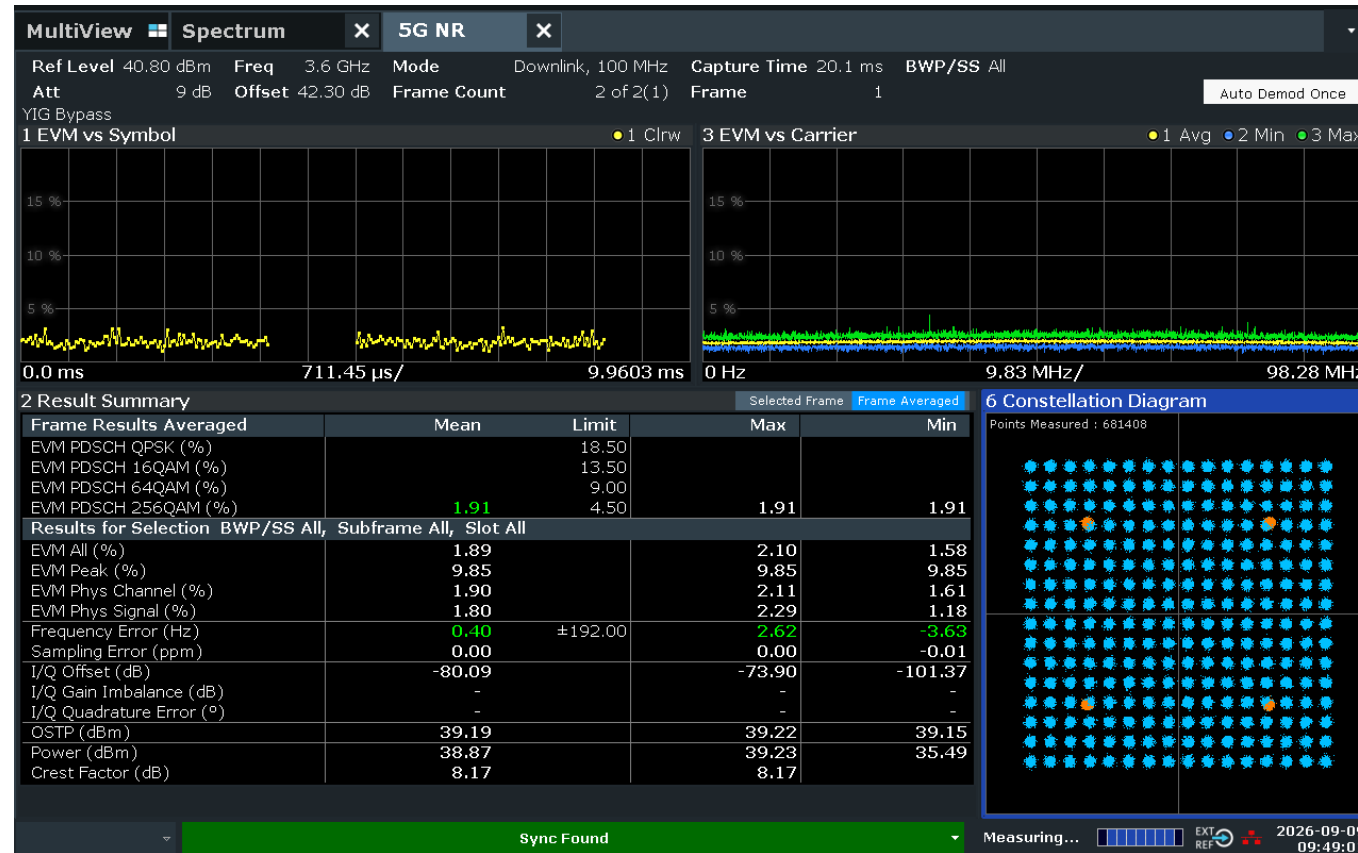
A3M36SL039 test results: case 3

EVM performance – without DPD



A3M36SL039 test results: case 3

EVM performance – with Wupatec DPD



Contact Info.

Address

WUPATEC LGS

Bâtiment Galiléo
20 rue Atlantis
87068 LIMOGES
FRANCE

WUPATEC TLS

Le California - Batiment B
1244 L'occitane
31670 LABEGE
FRANCE

Email

contact@wupatec.com

Website

www.wupatec.com