

FASTER MODULATION TESTING IN CHARACTERIZATION AND PRODUCTION

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ROHDE & SCHWARZ

Make ideas real



FASTER MODULATION TESTING

13:30 - 13:45

TUMA17: Faster Modulation Testing in Characterization and Production

Speaker: Markus Loerner

Speaker organization: Rohde & Schwarz

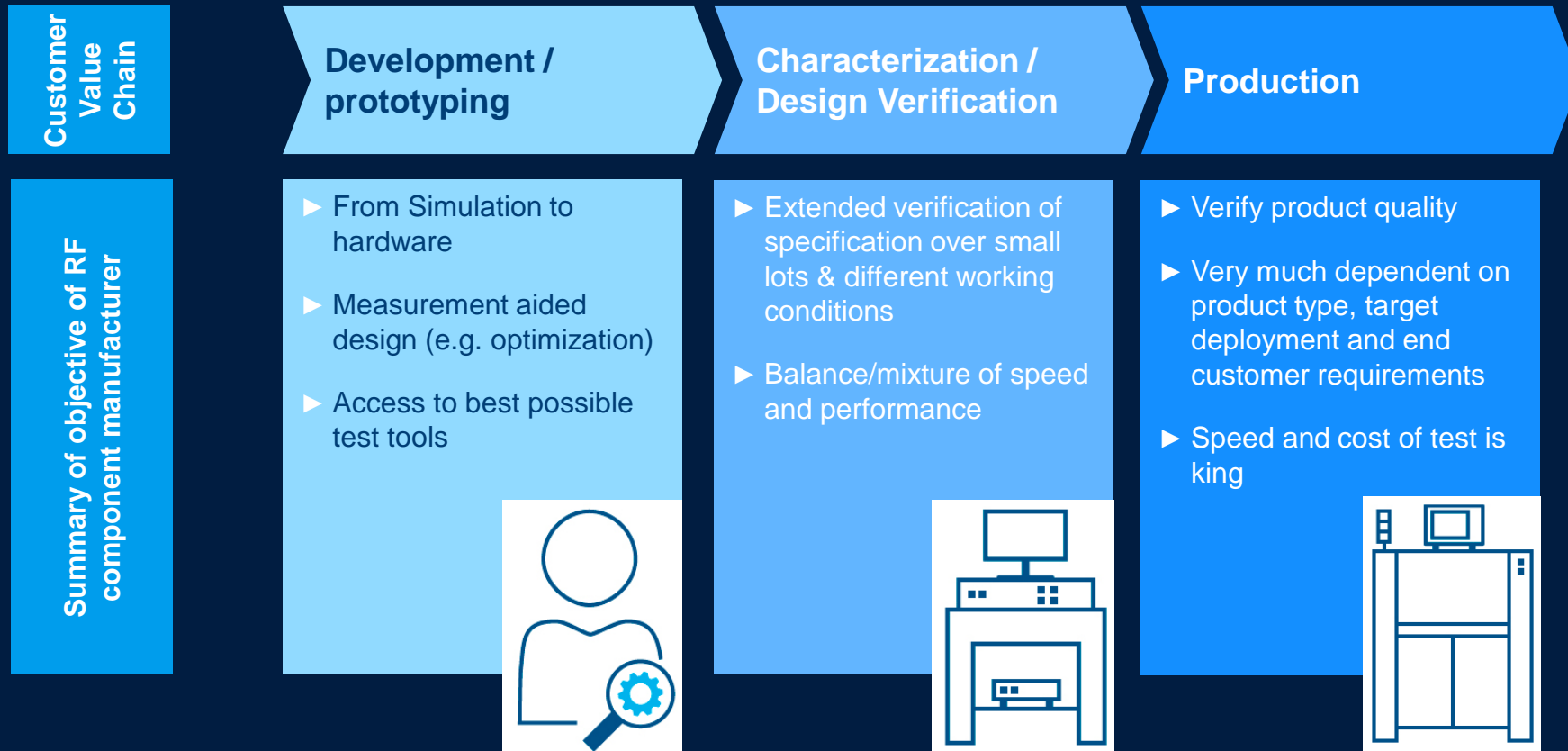
Location: MicroApps Theater, Booth 2447

Abstract:

Rohde & Schwarz is known for high end solutions in Research and Development. But characterization and production has its own rules with much more focus on speed and parallel testing.

This session is about translating R&D performance into high speed and parallel test applications while maintaining standard compliant test scenarios for the latest mobile communication standards.

FROM DEVELOPMENT TO PRODUCTION



FROM DEVELOPMENT TO PRODUCTION

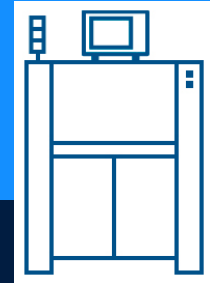
Customer
Value
Chain

Development /
prototyping

Characterization /
Design Verification

Production

Summary of objective of RF
component manufacturer





R&S®PVT360A

- Combined Vector signal generator and analyzer in one instrument x 2
- Ideal component testing and for base station
- Up to 8 GHz
- Multi-port operation
- 500 MHz signal bandwidth
- Dedicated measurement and signal generation applications
- Great EVM performance
- Very fast sequential measurements

R&S®PVT360A

Key facts

Compact design
→ 2 HU x 19 inch
→ 1x HU per Channel

RF parameters
→ Freq. up to 8 GHz
→ output power +8 dBm
→ Bandwidth: up to 500 MHz

1 or 2 TRX / Channel (VSA/VSG)

Doubled number of analyzers and generators (2x VSA / 2x VSG)

number of RF ports
(2x8)

Broadcast mode enables simultaneous transmission on all RF ports/outputs for receiver tests/ RX tests on the DUT

Flexible signal generation and analysis software

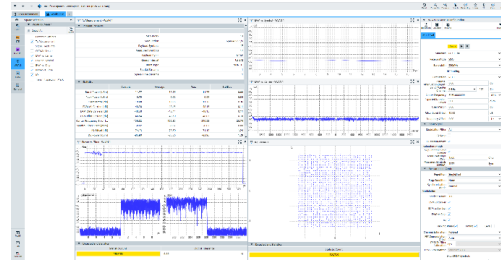
Integrated intuitive user interface

Linux Operating System

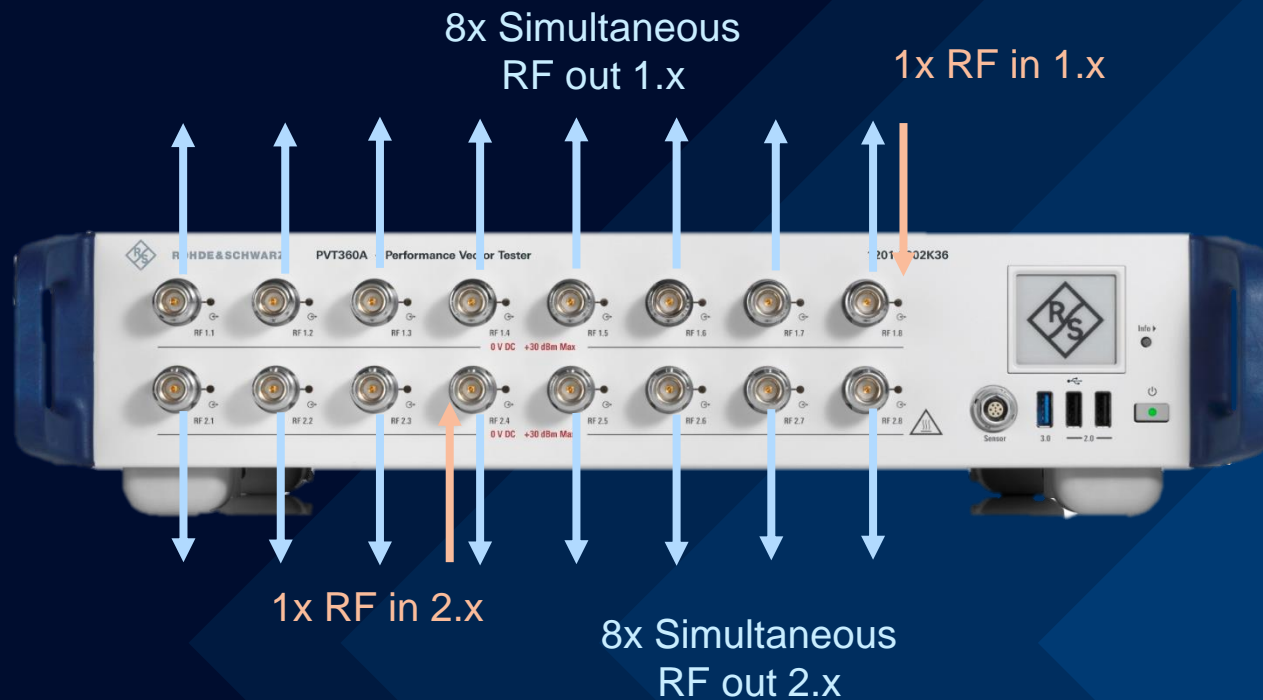
Simple Option concept

Status Display

R&S NRPx Power Sensors connectable



SWITCH MATRIX



SMART CHANNELS

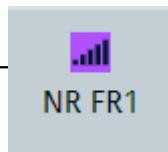


Integrated Sequencing for high speed testing

- ▶ Store waveform files in the RAM
- ▶ List increments of ARB Sequencer and meas. personality can be internally synchronized
- ▶ Example:

GPRF Gen1: Restart Marker

▼ Create/ Fill List							
Start Index	0	Stop Index	11	Fill List			
	Start with		Increment by		Keep		
Frequency	3500.000000	MHz	0.000000	MHz	<input type="checkbox"/>		
Level	-30.00	dBm	1.00	dBm	<input type="checkbox"/>		
Digital Gain	0.00	dB	0.00	dB	<input checked="" type="checkbox"/>		
▼ Sequencer List							
No.	Frequen...	Level (R...	Digital G...	Signal	Sample ...	List Incre...	List Tran...
↕ 0 :	3500.00...	-30.00	0.00	5GNR_U ▾	122.880...	MEASUF ▾	IMMEDI ▾
↕ 1 :	3500.00...	-29.00	0.00	CONTIN ▾	---	MEASUF ▾	IMMEDI ▾
↕ 2 :	3500.00...	-28.00	0.00	CONTIN ▾	---	MEASUF ▾	IMMEDI ▾
↕ 3 :	3500.00...	-27.00	0.00	CONTIN ▾	---	MEASUF ▾	IMMEDI ▾
↕ 4 :	3500.00...	-26.00	0.00	CONTIN ▾	---	MEASUF ▾	IMMEDI ▾
↕ 5 :	3500.00...	-25.00	0.00	CONTIN ▾	---	MEASUF ▾	IMMEDI ▾
↕ 6 :	3500.00...	-24.00	0.00	CONTIN ▾	---	MEASUF ▾	IMMEDI ▾
↕ 7 :	3500.00...	-23.00	0.00	CONTIN ▾	---	MEASUF ▾	IMMEDI ▾
↕ 8 :	3500.00...	-22.00	0.00	CONTIN ▾	---	MEASUF ▾	IMMEDI ▾
↕ 9 :	3500.00...	-21.00	0.00	CONTIN ▾	---	MEASUF ▾	IMMEDI ▾
↕ 10 :	3500.00...	-20.00	0.00	CONTIN ▾	---	MEASUF ▾	IMMEDI ▾

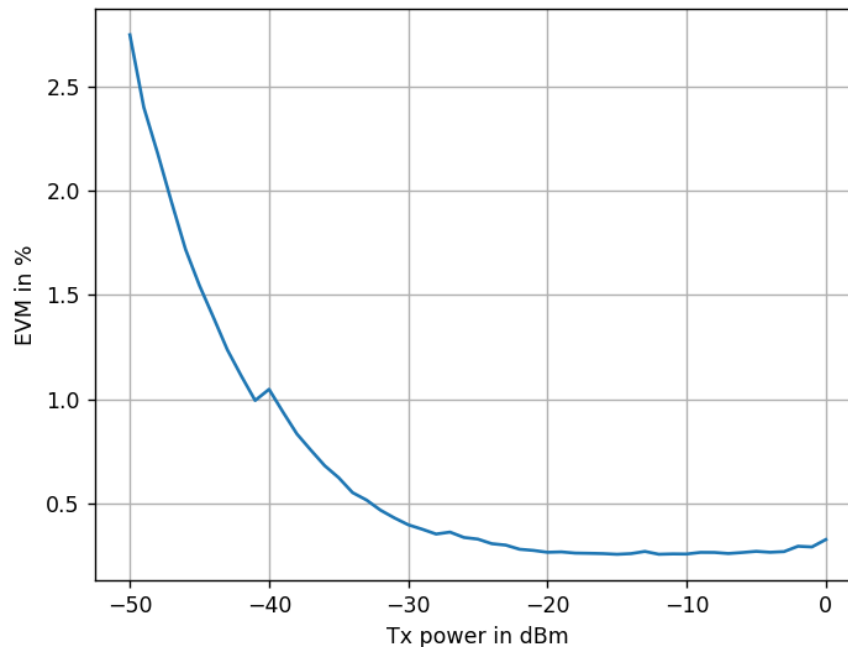


```
CONF:NRSUB:MEAS:LIST:SEGM1:SET <...>
CONF:NRSUB:MEAS:LIST:SEGM2:SET <...>
CONF:NRSUB:MEAS:LIST:SEGM3:SET <...>
CONF:NRSUB:MEAS:LIST:SEGM4:SET <...>
CONF:NRSUB:MEAS:LIST:SEGM5:SET <...>
CONF:NRSUB:MEAS:LIST:SEGM6:SET <...>
CONF:NRSUB:MEAS:LIST:SEGM7:SET <...>
CONF:NRSUB:MEAS:LIST:SEGM8:SET <...>
CONF:NRSUB:MEAS:LIST:SEGM9:SET <...>
CONF:NRSUB:MEAS:LIST:SEGM10:SET <...>
CONF:NRSUB:MEAS:LIST:SEGM11:SET <...>
Trigger Source: GPRF Gen1: Rest Marker
```

Measurement complete

Integrated Sequencing for high speed testing

- ▶ 51 segment (power sweep)
 - 3 subframes captured each
 - 1 slot of first subframe analyzed
- ▶ Total execution time: approx. only 1 sec. !



The PVT360A Performance Vector Tester

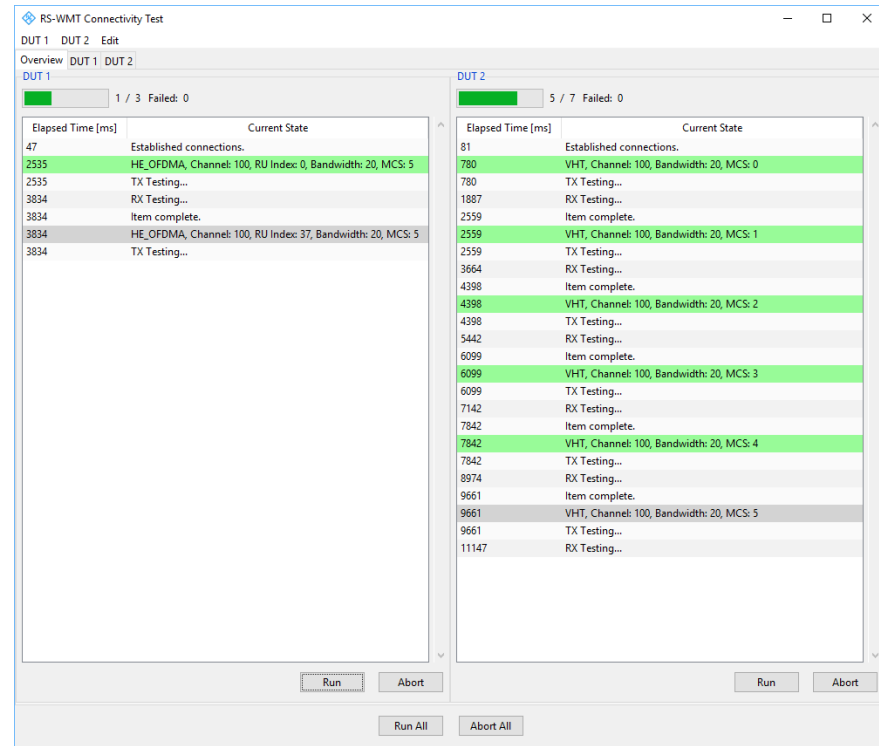
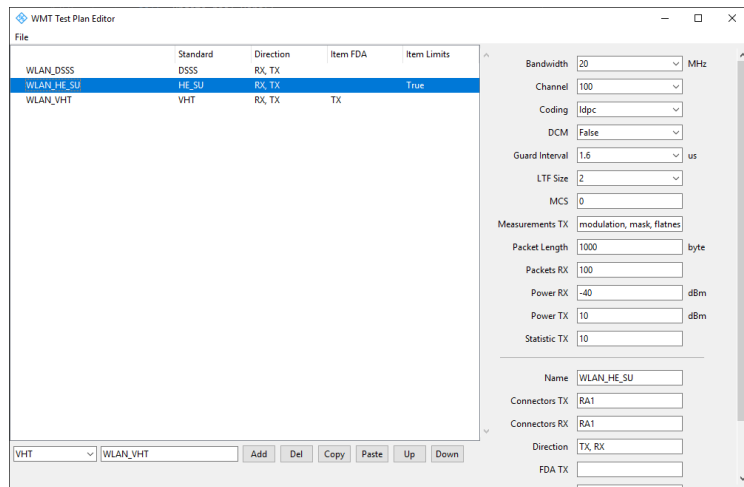
a closer look

- ▶ Signal generation and analysis for 4G, 5G, Wi-Fi up to 802.11be, BT
- ▶ Supported RF measurements: IP3, harmonics, spurs, ACLR, SEM, EVM, gain, gain compression, ...
- ▶ Fully supported by
 - [R&S WinQSIM2 signal creation software](#)
 - [R&S VSE analysis software](#) in Q2/23
- ▶ Use of NRP sensors for calibration and accurate power measurements
- ▶ Integrated Sequencing



WMT – Wireless Manufacturing Test

- ▶ R&S sequencing software
- ▶ Modular architecture for flexible integration and minimum time-to-market



PVT360A Performance Vector Tester

Summary

- ▶ Maximized speed
- ▶ Minimized cost per test
- ▶ Fully automated setups
- ▶ Parallelized testing
- ▶ Integration into SW environment
- ▶ Correlation between characterization and production setup

