

# IMPROVE THROUGHPUT IN PRODUCTION AND CHARACTERIZATION

High throughput is the key production metric for efficient operation. Improving test speed helps reduce the cost per device. The R&S®PVT360A performance vector tester is optimized for high speed production tests. Using approaches related to the development setups helps to maintain correlation of the test results throughout the value chain.



R&S®PVT360A performance vector tester

## Your task

As a test engineer or manager for production and characterization testing of RF frontends and power amplifiers, you need to ensure proper and fast measurements to verify product quality while minimizing testing costs. The performance limits and functional test scope are typically defined by development and test engineering teams that want to get the job done as quickly and efficiently as possible. Test speed and parallelization are the key factors to find the best solution and ensure the right time to market in characterization and a flexible and scalable solution in production.

## Rohde & Schwarz production-oriented solutions

Rohde & Schwarz is well known for its industry leading modulation solutions that offer excellent error vector magnitude (EVM) test capabilities over a large frequency range and wide modulation bandwidth for development and challenging characterization tasks.

In production, correlation with development and characterization tests is a major task. Using approaches that are related but faster, more compact and more cost-efficient is ideal to ensure the required correlation throughout the value chain.

Rohde & Schwarz meets these needs with the production-oriented R&S®PVT360A performance vector tester. It combines vector signal generation and analysis capabilities derived from the reference station setup for a perfectly synchronized approach. The instrument translates the company's knowledge into a targeted production solution that also excels at characterization with a focus on maximum test speed while ensuring the required RF performance.



Reference test station with R&S®SMW200A and R&S®FSW for demanding performance in EVM requirements across wide frequency and bandwidth range.

Application Card | Version 01.00

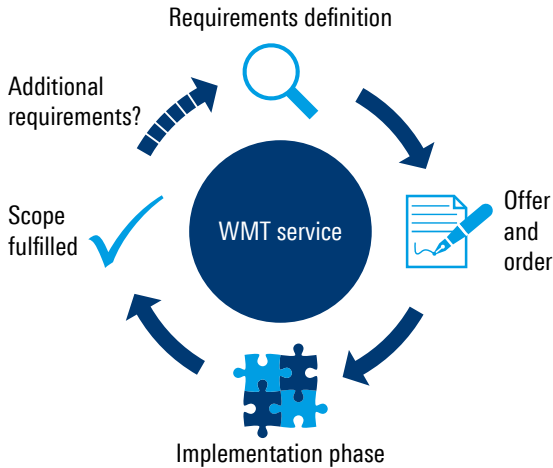
**ROHDE & SCHWARZ**

Make ideas real



Since a complete solution is often more than a single instrument, Rohde&Schwarz offers an implementation service to translate the test plan into a test script that optimizes test flow and presents test results as required. This can include multiple instruments and control of the test device.

### The Rohde & Schwarz WMT software service



### Application

Multiple optimizations improve test speed. Optimized hardware and streamlined test processes are two major factors that can be combined. In addition to the fast hardware platform, the R&S®PVT360A supports integrated hardware-accelerated sequencing that controls the internal signal generation and analysis. Once programmed and started, it outputs test results from the internal measurements without any external interactions slowing down the process. While a separate command list is offered for the generation and analysis part to provide maximum flexibility, an internally aligned process flow between both sides performs measurements across level, frequency and other parameters in minimal time.

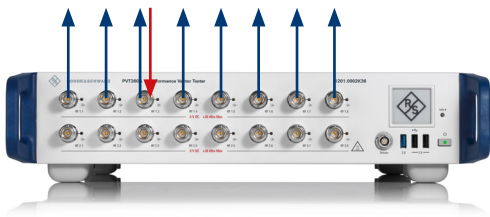
Parallelization is another method to further increase test throughput. On one side, the instrument internally performs the next RF measurement while processing the data from the previous one. Measurement capturing and data evaluation run in parallel with a flexible buffer in between. On the other side, the R&S®PVT360A can support two transceivers internally, resulting in two independent signal generator and analyzer pairs to test two devices simultaneously.

In a production setup, where the test devices are put into a test fixture, the indexing time, i.e. the handling time to bring the devices to the load board on the test station, can significantly contribute to the overall production test time. The test fixture often supports multiple devices that are loaded in one process step before the functional and performance tests. To connect the fixtures to the test instruments, a switch matrix is used to map the fixture ports to the test ports of the instruments. The R&S®PVT360A already includes 16 RF ports with a fully integrated solid-state switch matrix, allowing fast and wear-free switching between the different ports and thus the different test devices.

While the signal output can be routed to one or multiple ports at the same time to precondition the test device, the analysis part takes the data for one port at a time. When equipped with two transceivers, both analyzers work in parallel and record signals from two different devices simultaneously.

To simplify the programming and handling of the integrated switch matrix, the smart channel option provides as many as eight virtual instruments. All handling, scheduling and switching between the ports is done automatically to maximize resource utilization and speed.

### Integrated switch matrix enables fast sequencing through multiple DUT ports



### Eight virtual instruments for parallelized setups



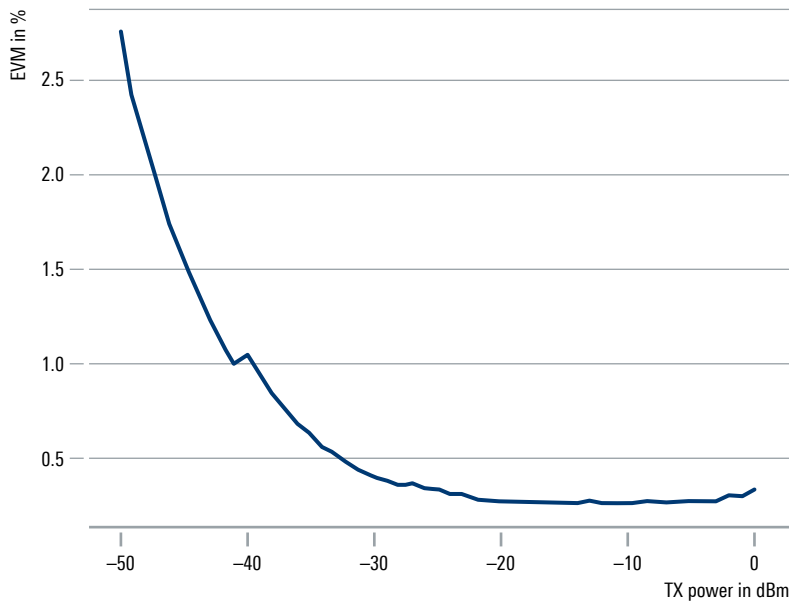
## Summary

With the R&S®PVT360A, Rohde&Schwarz is translating its expertise in development reference stations to a production-oriented solution focusing on maximum throughput and speed.

## See also

[www.rohde-schwarz.com/products/test-and-measurement/vector-testers/pvt360a](http://www.rohde-schwarz.com/products/test-and-measurement/vector-testers/pvt360a)

## Resulting EVM bathtub curve



## Internal hardware-accelerated sequencing for fast signal generation and analysis interaction

### GPRF Gen1: restart marker

Create/ Fill List							
Start Index	0	Stop Index	11	Fill List			
Frequency	3500.000000	MHz	0.0000000	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



NR FR 1

```
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

## Internal hardware-accelerated sequencing for maximum test speed

More than 50 standard-compliant 5G NR measurements per second enable fast recording of a complete bathtub curve showing the EVM performance of a device over more than 50 level points.

## Service at Rohde & Schwarz You're in great hands

- ▶ Worldwide
- ▶ Local and personalized
- ▶ Customized and flexible
- ▶ Uncompromising quality
- ▶ Long-term dependability

## Rohde & Schwarz

The Rohde&Schwarz technology group is among the trailblazers when it comes to paving the way for a safer and connected world with its leading solutions in test & measurement, technology systems and networks&cybersecurity. Founded more than 85 years ago, the group is a reliable partner for industry and government customers around the globe. The independent company is headquartered in Munich, Germany and has an extensive sales and service network with locations in more than 70 countries.

[www.rohde-schwarz.com](http://www.rohde-schwarz.com)

## Sustainable product design

- ▶ Environmental compatibility and eco-footprint
- ▶ Energy efficiency and low emissions
- ▶ Longevity and optimized total cost of ownership

Certified Quality Management

ISO 9001

Certified Environmental Management

ISO 14001

## Rohde & Schwarz training

[www.training.rohde-schwarz.com](http://www.training.rohde-schwarz.com)

## Rohde & Schwarz customer support

[www.rohde-schwarz.com/support](http://www.rohde-schwarz.com/support)

