PRODSP TECHNOLOGIES

Fundamentals of Industrial Measurement Technology

Radio Frequency Measurement

ProDSP Post Series Nr.33.

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RF measurements

The goal of RF testing is to **validate the radio-frequency characteristics** of manufactured products, typically in an **EOL** (End-of-Line) environment.

This stage is chosen because every prior manufacturing and assembly step can **impact RF parameters**.

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Typically measured characteristics (transmission)

- Carrier frequency accuracy
- Radiated power and spectrum
- Correctness of modulation parameters

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Typically measured characteristics (reception)

- Received signal level
- Bit error rate (BER)

(these are measured by the DUT’s own RF frontend, reflecting real-world operation)

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Test methods

- **Signaling:** real RF communication with the DUT (expensive, thorough, common in automotive)
- **Non-signaling:** predefined waveform with an external control channel (fast, cost-effective)

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Connection to the test instrument

- **Radiated mode:** via antenna, inside an isolation chamber
- **Conducted mode:** coaxial cable + attenuator, more accurate and repeatable

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Critical infrastructure

- **Antennas** (bandwidth, radiation pattern, polarization, impedance)
- **RF chamber** (isolation, orientation, feedthroughs)
- For passive DUTs: **VNA-based measurements**

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