AUTOMOTIVE RADAR

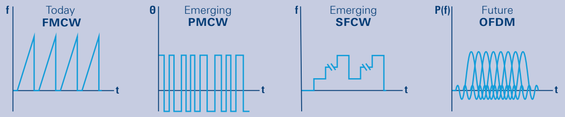
Development of radar as the key sensor for advanced driver assistance systems (ADAS) and autonomous driving (AD)

Chipsets, sensors and vehicles need to be tested thoroughly at each phase of the development and integration process. Radar test solutions from Rohde & Schwarz, ranging from compact to scalable complex target simulators, cover the entire lifecycle from development and validation to production and beyond. We enable the automotive industry to develop high-performance radars and transition seamlessly from R&D to production.

Radar sensor parameters

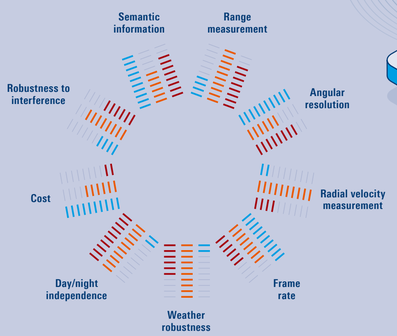
	Short-range radar	Standard mid-range radar	Premium mid-range radar	Standard long-range radar	Premium long-range radar	Imaging radar
Frequency range (GHz)	24, 76–77, 77–81	76–77	77–81	76–77	76–77	76–81
Typical bandwidth (MHz)	200, 1000, 4000	1000	2000	500	1000	2000
Range (m)	80	150	150	250	300	300
Range resolution (cm)	75, 15, 3.75	15	7.5	30	15	7.5
FOV azimuth/elevation (°)	±60/±0	±30/±0	±50/±15	±15/±5	±15/±10	±50/±15
Typical number of channels (transmit/receive)	3 TX/4 RX	4 TX/8 RX	8 TX/12 RX	4 TX/8 RX	12 TX/16 RX	48 TX/48 RX

Radar signal modulation schemes



Strength of radar sensors versus other sensor technologies

- Instantaneous measurement of distance, azimuth, elevation, velocity and RCS (4D)
- Functions in the dark and in adverse environmental conditions such as rain, fog and dust
- Accurate and reliable physical environment perception due to complementary characteristics to camera and lidar
- Cost efficient due to high volume and market penetration
- Strong performance improvement potential via MIMO, point cloud processing including AI and higher frequency bands



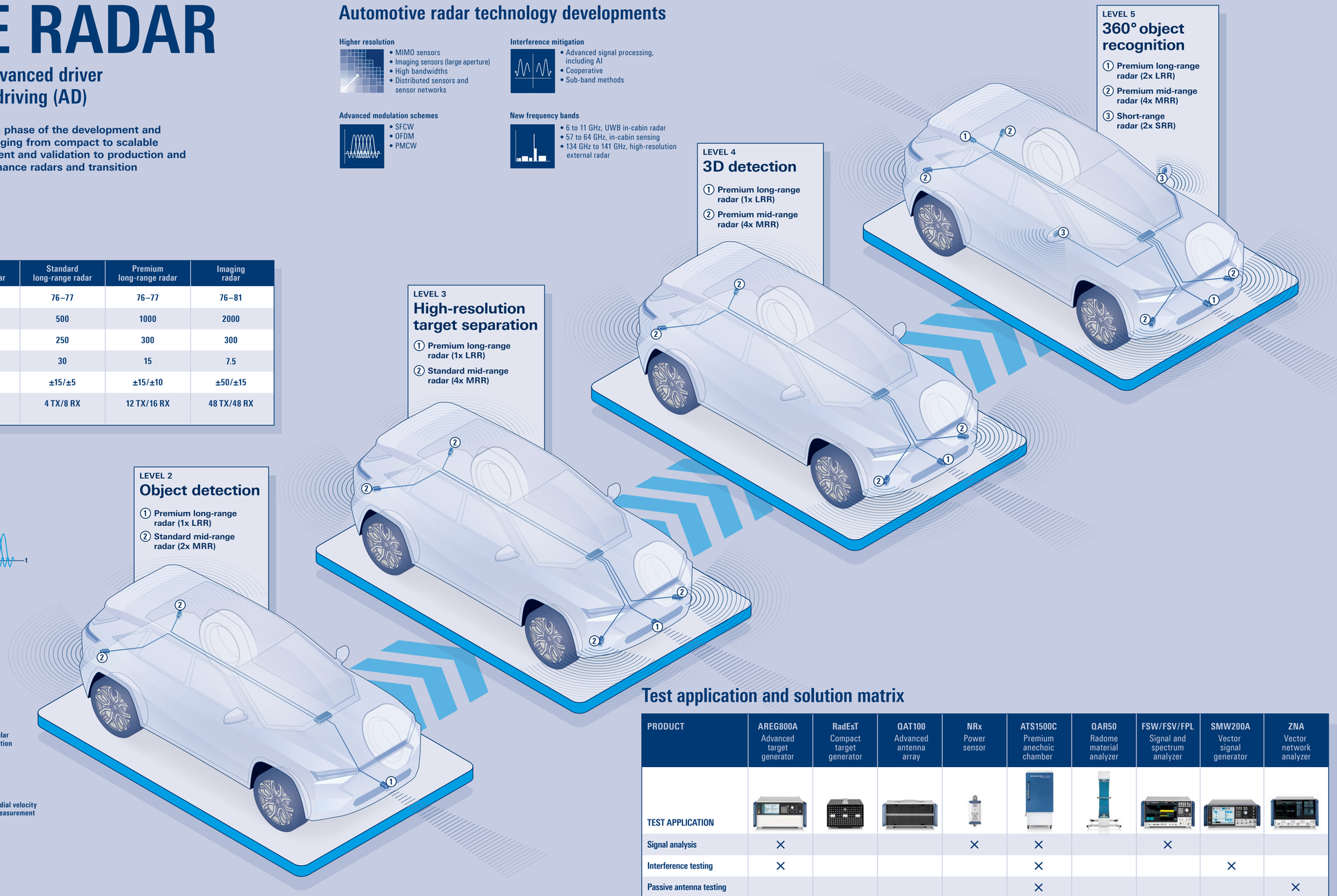
Automotive radar technology developments

Higher resolution
- MIMO sensors
- Imaging sensors (large aperture)
- High bandwidths
- Distributed sensors and sensor networks

Interference mitigation
- Advanced signal processing, including AI
- Cooperative
- Sub-band methods

Advanced modulation schemes
- SFCW
- OFDM
- PMCW

New frequency bands
- 6 to 11 GHz, UWB in-cabin radar
- 57 to 64 GHz, in-cabin sensing
- 134 GHz to 141 GHz, high-resolution external radar



Test application and solution matrix

PRODUCT	AREG800A Advanced target generator	RadEsT Compact target generator	QAT100 Advanced antenna array	NRx Power sensor	ATS1500C Premium anechoic chamber	QAR50 Radome material analyzer	FSW/FSV/FPL Signal and spectrum analyzer	SMW200A Vector signal generator	ZNA Vector network analyzer
TEST APPLICATION									
Signal analysis	×			×	×		×		
Interference testing	×				×			×	
Passive antenna testing					×				×
Functional validation	×	×	×						
Radome and bumper testing						×			
EOL calibration and production testing	×	×		×		×	×		

Learn more:
www.rohde-schwarz.com/automotive/radar

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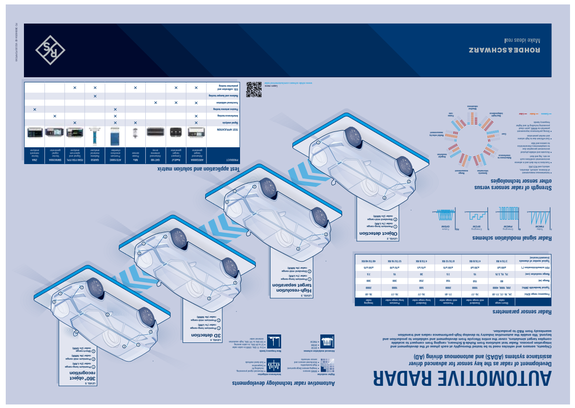

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