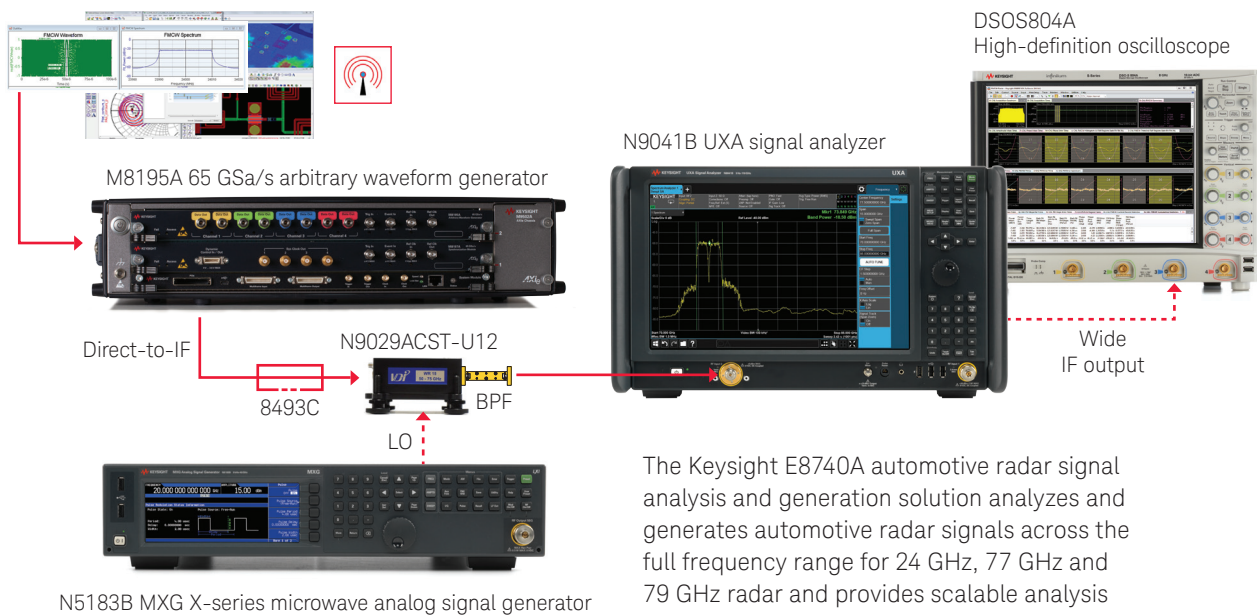


# Keysight Technologies

## E8740A Automotive Radar Signal Analysis and Generation Solution

Data Sheet



The Keysight E8740A automotive radar signal analysis and generation solution analyzes and generates automotive radar signals across the full frequency range for 24 GHz, 77 GHz and 79 GHz radar and provides scalable analysis bandwidth from 2.5 GHz to > 5 GHz, depending on test requirements.

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## Next-generation Automotive Radar Test Challenges

Due to time, cost, and knowledge constraints, many project managers are no longer re-evaluating their test methodology for every new design roll-out. Not doing so for the development of > 79 GHz bandwidth radar modules can expose their project to costly design risks. When measuring high frequencies such as 79 GHz radar, during the setup of the test methodology and test equipment, you need to consider the challenges associated with the test setup, ultra wideband mmWave measurements, and signal-to-noise (SNR) loss. Not accounting for these requirements will impact the quality and performance of your radar module, potentially leading to expensive redesign, lengthened design cycles, and even possible product recalls.

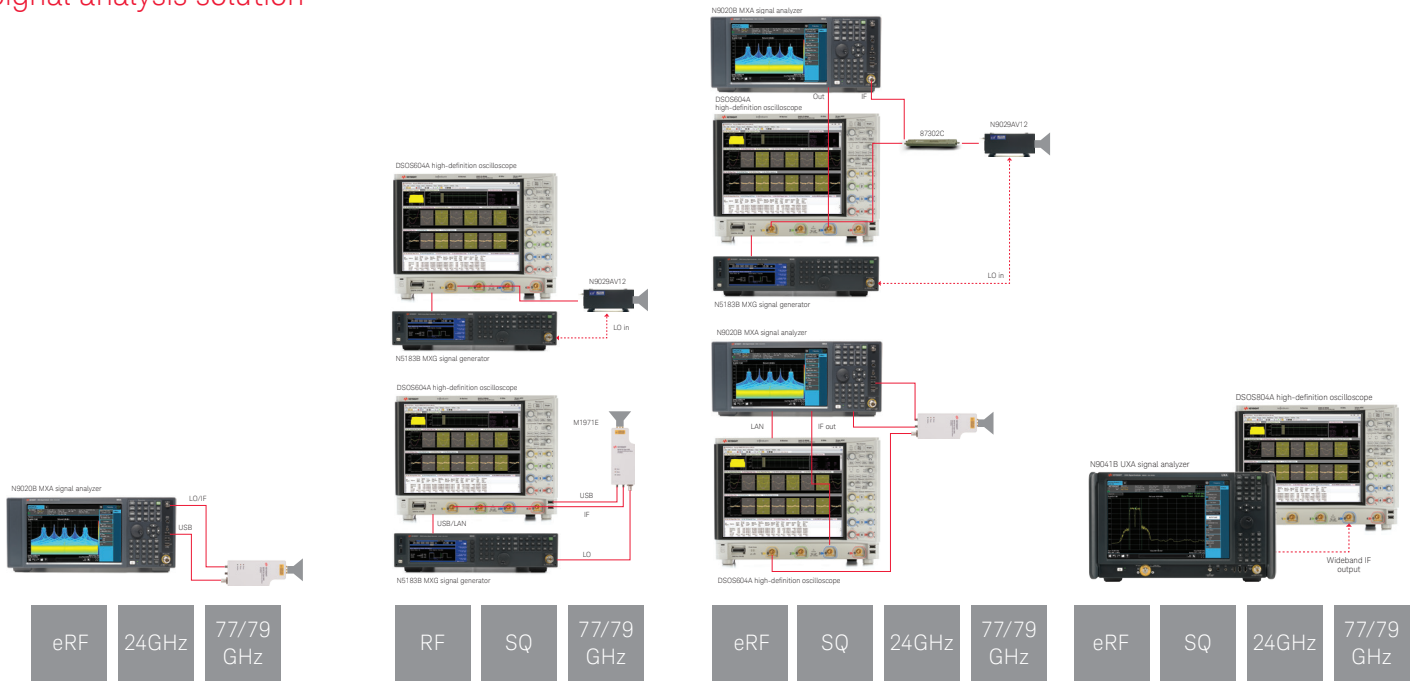
## Keysight Automotive Radar Signal Analysis and Generation Solution

The Keysight E8740A automotive radar signal analysis and generation solution analyzes and generates automotive radar signals across the full frequency range for 24 GHz, 77 GHz and 79 GHz radar. It provides scalable analysis bandwidths, from 2.5 GHz to > 5 GHz, depending on your test requirement.

There is one solution configuration for signal generation, and six solution configurations for analyzing automotive radar signals, depending on test requirements and budget. You can expand your test capabilities by integrating the Keysight W1908 SystemVue automotive radar library software for simulation of multi-target detection and automotive radar 3D scan.

# E8740A Automotive Radar Signal Analysis (SA) and Signal Generation (SG) Configurations

## Signal analysis solution



**E8740A-010 Radar RF SA**  
**Leading cost effective auto radar RF test tool**

- 10 Hz to 26.5 GHz, 60 GHz to 90 GHz
- FMCW RF analysis

**E8740A-020, 030 Basic SA**  
**Optimum choice for auto radar signal quality test**

- 60 GHz to 90 GHz, > 5 GHz BW (Basic +) for FMCW Quality analysis

**E8740A-040, 050 Advanced SA**  
**Benchmark for demanding applications**

- 10 Hz to 26.5 GHz, 60 GHz to 90 GHz
- 2.5 GHz BW, > 5 GHz BW (Advanced +) for FMCW Quality analysis

**E8740A-060 Performance SA**  
**Wide-open performance**

- 3 Hz to 110 GHz
- > 5 GHz BW for FMCW Quality analysis
- DANL -174 dBm
- 20 MHz~3.6 GHz (Preamp On with Opt NF2), -149 dBm
- 55 GHz~70 GHz
- 2.4 mm, 1 mm input

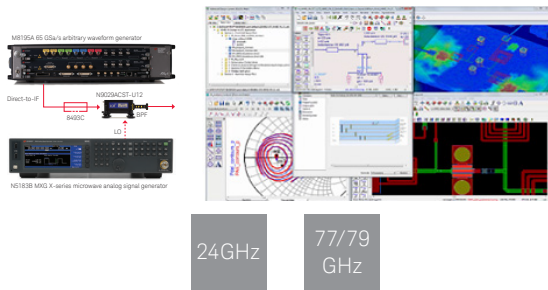
**X-Series Applications**  
 Ready-to-use RF measurements

**89600 VSA Software**  
 Comprehensive demodulation & vector signal analysis

**E8742A-001 FMCW Radar Analysis Assistant**  
 Easy U/I for downconverter set up and FMCW analysis (VSA utility)

eRF: Enhanced RF test (Swept tune), RF: FFT method, SQ: Signal quality

## Signal generation solution



### E8740A-070 Performance SG

#### Wide-open performance

- 60 GHz to 90 GHz
- > 5 GHz 3 dB BW
- FM, PM, FMCW, pulse sequence, MFSK, customer OFDM
- Linear FMCW multi-targets, automotive radar 3D scan and walking pedestrian scenarios with micro Doppler effect using SystemVue

### SystemVue

W1908 Auto radar library measurements



### Signal Studio

N7608C FCM/FMCW/Custom FMCW/MFSK signal creation



### E8742A-002 FMCW Radar Generation Assistant

Easy U/I for upconverter set up, FMCW/FCM signal creation and wideband calibration (IQ Tools utility)

## Solution features

### E8740A Automotive Radar Signal Analysis and Generation Solution Features and Benefits

Configuration	Features and benefits
Radar RF SA	<ul style="list-style-type: none"> <li>- 10 Hz to 26.5 GHz, 60 GHz to 90 GHz</li> <li>- FMCW RF analysis</li> </ul>
Basic SA	<ul style="list-style-type: none"> <li>- 60 GHz to 90 GHz</li> <li>- 2.5 GHz BW for FMCW signal quality analysis</li> </ul>
Basic Plus SA	<ul style="list-style-type: none"> <li>- 60 GHz to 90 GHz</li> <li>- &gt; 5 GHz BW for FMCW signal quality analysis</li> </ul>
Advanced SA	<ul style="list-style-type: none"> <li>- 10 Hz to 26.5 GHz, 60 GHz to 90 GHz</li> <li>- 2.5 GHz BW for FMCW signal quality analysis</li> </ul>
Advanced Plus SA	<ul style="list-style-type: none"> <li>- 10 Hz to 26.5 GHz, 60 GHz to 90 GHz</li> <li>- &gt; 5 GHz BW for FMCW signal quality analysis</li> </ul>
Performance SA	<ul style="list-style-type: none"> <li>- 3 Hz to 110 GHz</li> <li>- &gt; 5 GHz BW for FMCW signal quality analysis</li> <li>- DANL-171dBm/Hz at 1 GHz, -150 dBm/Hz up to 110 GHz</li> </ul>
RF Input Connector	<ul style="list-style-type: none"> <li>- 2.4 mm male, 50 Ω nominal</li> <li>- 1.0 mm male ruggedized, 50 Ω nominal</li> </ul>
Performance SG	<ul style="list-style-type: none"> <li>- DC to 25 GHz, 60 GHz to 90 GHz</li> <li>- &gt; 5 GHz 3 dB BW</li> <li>- FM, PM, FMCW, pulse sequence, MFSK, custom OFDM</li> <li>- Linear FMCW multi-targets, automotive radar 3D scan and walking pedestrian scenarios with micro Doppler effect using SystemVue</li> </ul>

## E8740A-010 Radar RF Signal Analysis

N9020B MXA signal analyzer



### Solution Specifications and Characteristics

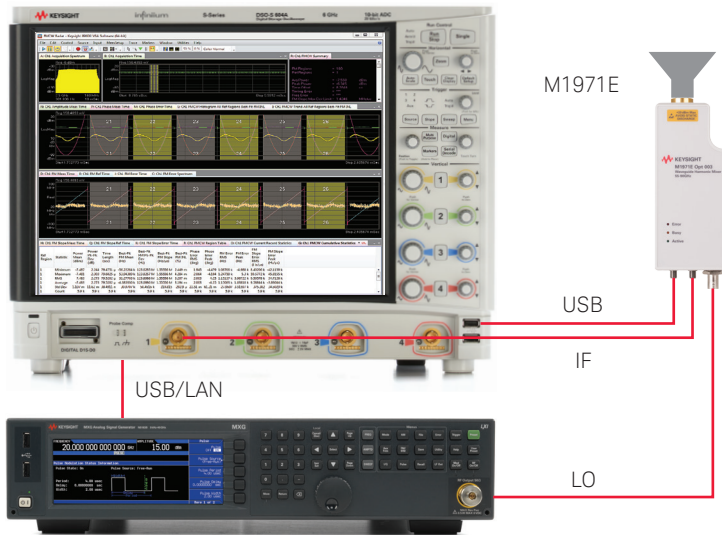
#### E8740A-010 Radar RF SA

Signal analysis	RF test
Frequency range	3 Hz ~ 26.5 GHz, 60 GHz ~ 90 GHz
DANL/Noise floor	-165 dBm/Hz at 1 GHz -139 dBm/Hz at 77 GHz, typical
Total absolute amplitude accuracy	3 Hz to 26.5 GHz, $\pm (0.33 \text{ dB} + \text{frequency response})$ (10 dB attenuation, 20 to 30 °C, 1 Hz $\leq$ RBW $\leq$ 1 MHz, input signal -10 to -50 dBm, all settings auto-coupled except Auto Swp Time = Accy, any reference level, any scale, $\sigma$ = nominal standard deviation)
RF input limit : Compr./damage (dBm)	60 GHz to 90 GHz, $\pm 2.2 \text{ dB}$ , Calibration accuracy* (nominal) 30 dBm up to 26.5 GHz 20 dBm at 60 GHz to 90 GHz
Connector type	N-type connector and WR12

\* Calibration accuracy is the difference between the conversion loss factors measured and programmed into the M1971E/V/W at the factory and the actual conversion loss of the mixer when used with an X-Series signal analyzer and Option EXM. The values shown include test system uncertainty, interpolation error, and the effects of the difference between the X-Series environment and the factory calibration environment. The system amplitude accuracy is worse than the M1971E/V/W only calibration accuracy due to the SWR effects between the M1971E/V/W and the X-Series IF input, and due to gain accuracy at the IF input of the X-Series analyzer used.

## E8740A-020 Basic Radar Signal Analysis

DSOS604A high-definition oscilloscope



N5183B MXG signal generator

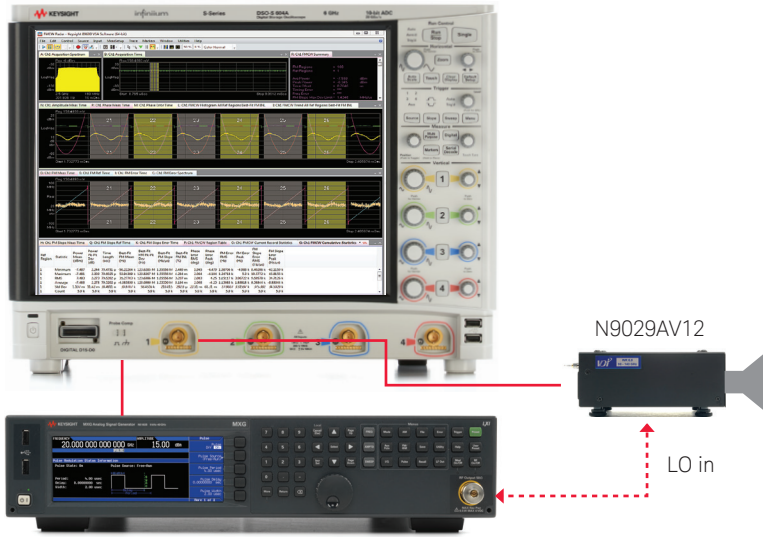
### Solution Specifications and Characteristics

#### E8740A-020 Basic SA

Signal analysis	RF test (FFT) and FMCW signal quality
Frequency range	~6 GHz, 60 GHz ~ 90 GHz
Demodulation bandwidth	2.5 GHz (3 dB BW)
External digitizer resolution and ADC bit	10 bits up to 8 GHz (Min resolution : 0.781 mV)
Noise floor	-126 dBm/Hz at 76~81 GHz (using M1971E AUX path mode with DSO scope)
Absolute amplitude accuracy	± 1 dB at 0 to 6 GHz (DSOS604A scope input) ± 2 dB at 76~81 GHz (Typical with correction)
RF input limit : Compr./damage (dBm)	20 dBm at 60 GHz to 90 GHz 0 dBm P1dB
Connector type	WR12

## E8740A-030 Basic Plus Radar Signal Analysis

DSOS604A high-definition oscilloscope



N5183B MXG signal generator

### Solution Specifications and Characteristics

#### E8740A-030 Basic plus SA

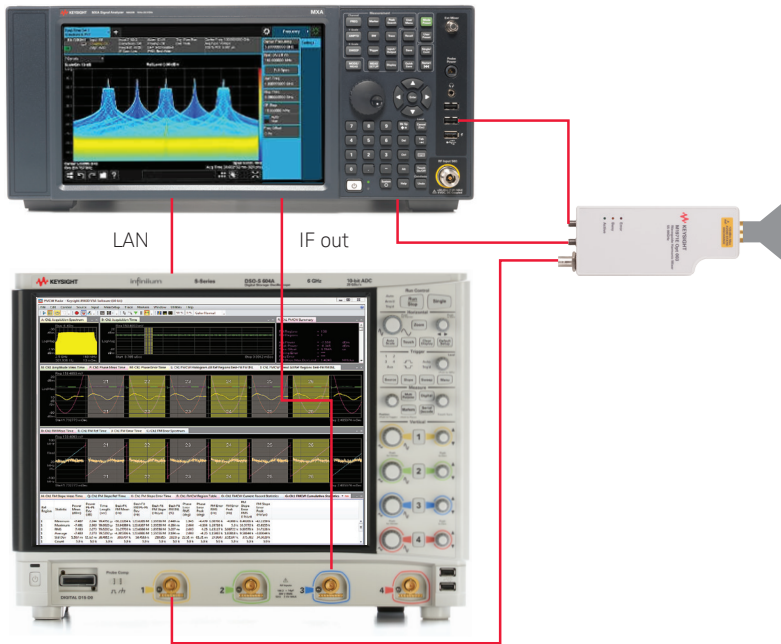
Signal analysis	RF test (FFT) and FMCW signal quality
Frequency range	~6 GHz, 60 GHz ~ 90 GHz
Demodulation bandwidth	3.5 GHz (3 dB BW) <sup>1</sup>
External digitizer resolution and ADC bit	10 bits up to 8 GHz (Min. resolution : 0.781 mV)
Noise floor	-135 dBm/Hz at 76~81 GHz
Absolute amplitude accuracy	± 1 dB at 0 to 6 GHz (DSOS604A scope input) ± 2 dB at 76~81 GHz (Typical with correction)
RF input limit: Compr./damage (dBm)	-10 dBm / 0 dBm at 60 GHz to 90 GHz -10 dBm P1dB
Connector type	WR12

1. Measurement bandwidth can be extended to 5 GHz with correction.



## E8740A-040 Advanced Radar Signal Analysis

N9020B MXA signal analyzer



DSOS604A high-definition oscilloscope

### Solution Specifications and Characteristics

#### E8740A-040 Advanced SA

Signal analysis	RF test and FMCW signal quality
Frequency range	3 Hz ~ 26.5 GHz, 60 GHz ~ 90 GHz
Demodulation bandwidth	2.5 GHz (3 dB BW) using M1971E AUX path mode with DSO scope
External digitizer resolution and ADC bit	10 bits up to 6 GHz (Min. resolution : 0.781 mV)
DANL/Noise floor	N9020B (DANL) -166 dBm / Hz at 1 GHz -139 dBm/Hz at 76 GHz DSOS604A (Noise floor) -126 dBm/Hz at 76~81 GHz
Absolute amplitude accuracy	N9020B 3 Hz to 26.5 GHz, $\pm$ (0.33 dB + frequency response) (10 dB attenuation, 20 to 30 °C, 1 Hz $\leq$ RBW $\leq$ 1 MHz, input signal -10 to -50 dBm, all settings auto-coupled except Auto Swp Time = Accy, any reference level, any scale, $\sigma$ = nominal standard deviation) 60 GHz to 90 GHz, $\pm$ 2.2 dB, Calibration accuracy* (nominal) 76 GHz to 81 GHz, $\pm$ 2 dB (typical with correction), using M1971E AUX path mode with DSO scope
RF input limit : Compr./damage (dBm)	30 dBm up to 26.5 GHz 20 dBm at 60 GHz to 90 GHz
Connector type	N-type connector and WR12
Resolution bandwidth extended (optional)	8 MHz standard, up to 133 MHz (N9020B)

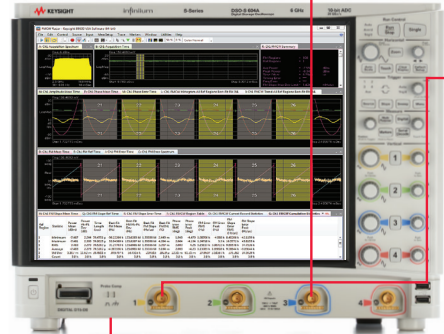
\*Calibration accuracy is the difference between the conversion loss factors measured and programmed into the M1971E/V/W at the factory and the actual conversion loss of the mixer when used with an X-Series signal analyzer and Option EXM. The values shown include test system uncertainty, interpolation error, and the effects of the difference between the X-Series environment and the factory calibration environment. The system amplitude accuracy is worse than the M1971E/V/W only calibration accuracy due to the SWR effects between the M1971E/V/W and the X-Series IF input, and due to gain accuracy at the IF input of the X-Series analyzer used.

## E8740A-050 Advanced Plus Radar Signal Analysis

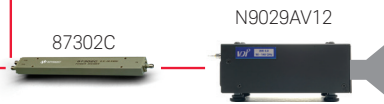
N9020B MXA signal analyzer



DSOS604A high-definition oscilloscope



N5183B MXG signal generator



LO in

### Solution Specifications and Characteristics

#### E8740A-050 Advanced Plus SA

Signal analysis	RF test and FMCW signal quality
Frequency range	3 Hz ~ 26.5 GHz, 60 GHz ~ 90 GHz
Demodulation bandwidth	3.5 GHz (3 dB BW) 5 GHz with correction
External digitizer resolution and ADC bit	10 bits up to 8 GHz (Min resolution : 0.781 mV)
DANL/Noise floor	N9020B -166 dBm/Hz at 1 GHz -140 dBm/Hz at 76 GHz DSOS604A -135 dBm/Hz at 76 GHz
Absolute amplitude accuracy	N9020B 3Hz to 26.5GHz, $\pm (0.33 \text{ dB} + \text{frequency response})$ (10 dB attenuation, 20 to 30 °C, 1 Hz $\leq$ RBW $\leq$ 1 MHz, input signal -10 to -50 dBm, all settings auto-coupled except Auto Swp Time = Accy, any reference level, any scale, $\sigma$ = nominal standard deviation) 60GHz to 90 GHz, $\pm 2.0 \text{ dB}$ (typical with system correction) DSO604A $\pm 2.0 \text{ dB}$ at 76 GHz to 81 GHz (typical with system correction)
RF input limit : Compr./damage (dBm)	30 dBm up to 26.5 GHz -10 dBm / 0 dBm at 60GHz to 90GHz
Connector type	N-type connector and WR12
Resolution bandwidth extended (optional)	8 MHz standard, up to 133 MHz (N9020B)

## E8740A-060 Performance Radar Signal Analysis

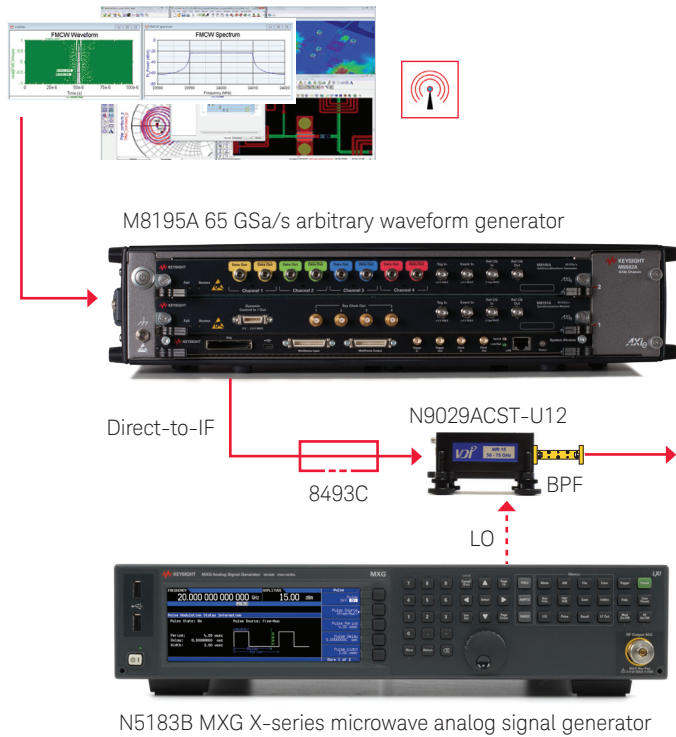


### Solution Specifications and Characteristics

#### E8740A-060 Performance SA

Signal analysis	RF test and FMCW signal quality
Frequency range	3 Hz ~ 110 GHz
Demodulation bandwidth	> 5 GHz
External digitizer resolution and ADC bit	10 bits up to 8 GHz (Min. resolution : 0.781 mV)
DANL/Noise floor	DANL -174 dBm 20 MHz~3.6 GHz (Preamp On with Opt NF2), -149 dBm 55 GHz to 70 GHz -144 dBm 70 GHz to 82 GHz
Absolute amplitude accuracy	± 0.19 dB at 0.05 to 3.6 GHz Input 1 10 dB input attenuation, 1 Hz ≤ RBW ≤ 1 MHz, input signal -10 to -50 dBm, all settings auto-coupled except Auto Swp Time = Accy, any reference level, any scale ± 2.5 dB at 75~110 GHz Input 2 (Nominal)
Maximum safe input level	+30 dBm (1W), Input 1 frequency ≤ 50 GHz +5 dBm (0.003W), Input 2 frequency > 65 GHz, Attenuator 2 setting = 0 dB
Connector type	Dual input rugged 2.4 mm and 1 mm connector
Resolution bandwidth extended (optional)	8 MHz standard, up to 212 MHz (N9041B)

## E8740A-070 Performance Radar Signal Generation



### Solution Specifications and Characteristics

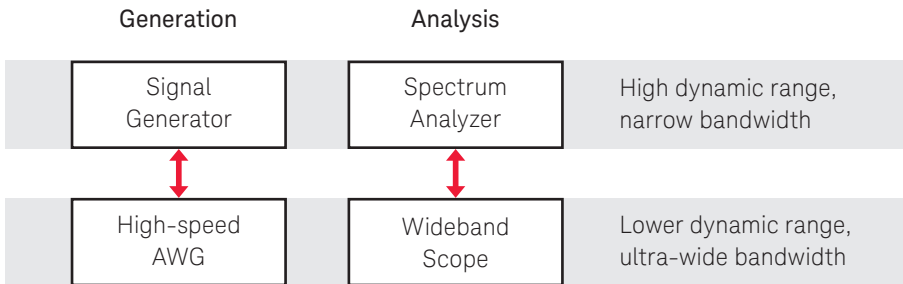
#### E8740A-070 Performance SG

Frequency range	DC to 25 GHz, 60 GHz to 90 GHz
Signal bandwidth for IF/RF	IF/RF up to 25 GHz
3 dB bandwidth for mmW	5 GHz for FMCW at 79 GHz Fc (with correction)
P1dB	-14.6 dBm at 76 GHz -13.5 dBm at 79 GHz
Amplitude flatness (at SMA connector,* compensated for sin(x)/x)	±2 dB (typ), f <sub>out</sub> = DC to 10 GHz +2 dB, -3 dB (typ), f <sub>out</sub> = 10 to 25 GHz (typ)
Amplitude resolution	200 uV (normal)
DAC resolution	8-bit
AWG sample rate	13.44 GSa/s to 65 GSa/s
Sample memory (internal/extended)	1 MSa / 16 GSa
Frequency switching time	505 us / 38 ps (opt FSW)
MIMO and beam forming	Expandable to 16 synchronized channels
mmW modulation signals	FM, PM, FMCW, pulse sequence, MFSK, custom OFDM
System design	Linear FMCW multi-targets, automotive radar 3D scan and walking pedestrian scenarios with micro Doppler effect using SystemVue

\* Measured at Data Out.

## Hardware – Instruments

Since digital-to-analog converter technology has improved significantly, arbitrary waveform generators (AWGs) can now generate direct RF signals with good signal fidelity and similar developments as well as on the analysis side with wideband scopes.



### N9041B UXA signal analyzer

[www.keysight.com/find/n9041b](http://www.keysight.com/find/n9041b)

Developing off-the-shelf tools for extremely high frequencies requires Keysight’s proven blend of measurement science and millimeter-wave expertise. The N9041B UXA X-Series signal analyzer exemplifies the company’s unique expertise, and the development team focused on meeting three key challenges in mmWave signal analysis: sensitivity, frequency range and analysis bandwidth.



### N9020B MXA signal analyzer

[www.keysight.com/find/n9020b](http://www.keysight.com/find/n9020b)

The Keysight N9020B MXA is the optimum choice as you take new-generation wireless devices to market. It has the flexibility to quickly adapt to evolving test requirements, today and tomorrow.

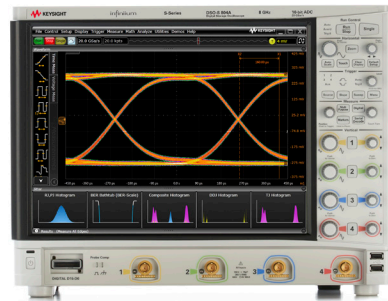


### DSO804A high-definition oscilloscope

[www.keysight.com/find/infiniium](http://www.keysight.com/find/infiniium)

Infiniium S-Series oscilloscopes incorporate innovative technology designed to deliver superior measurements.

Our new 10-bit ADC and low-noise front-end technology work together to provide up to 8 GHz performance with the industry’s best signal integrity. We put these in an advanced frame with a solid state drive for fast boot-up, capacitive 15” display for easy touch capability, and a high-powered motherboard for fast processing. It’s all compatible with a myriad of probes and Infiniium applications.



## N9029AV12

[http://www.keysight.com/find/sa\\_mmwave](http://www.keysight.com/find/sa_mmwave)

The Keysight N9029AV12 millimeter-wave signal analyzer frequency extension module is one of the mixer/amplifier/multiplier chain series (WRxx SAX Series) from VDI Inc. that has been designed to work directly with the N9030A PXA, N9020A MXA or N9010A EXA X-Series signal analyzers. The module provides high sensitivity millimeter measurements for the WR12 waveguide band covering 60 to 90 GHz. The N9029AV12 extends the high performance attributes of the X-Series signal analyzer into millimeter frequencies.

For more millimeter test equipment solutions, please contact Virginia Diodes, Inc. (VDI) at [www.vadiodes.com](http://www.vadiodes.com).

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## N9029ACST-U12

[http://www.keysight.com/find/sa\\_mmwave](http://www.keysight.com/find/sa_mmwave)

The Keysight N9029ACST- U12, D12 Compact Converter (CCU, CCD) modules are manufactured by Virginia Diodes, Inc. (VDI).

The CCU module provides high performance broadband frequency upconversion and the CCD provides the down-conversion. The modules can be used with microwave signal generators and spectrum analyzers to extend the frequency range. These modules achieve low conversion loss and excellent noise figure. Refer to the VDI User's Guide included on the USB drive.

For more millimeter test equipment solutions, please contact Virginia Diodes, Inc. (VDI) at [www.vadiodes.com](http://www.vadiodes.com).

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## M1971E waveguide harmonic mixers (smart mixers)

[www.keysight.com/find/smartmixers](http://www.keysight.com/find/smartmixers)

The Keysight M1971E 55/60 to 90 GHz waveguide harmonic mixer provides a complete solution for wideband millimeter-wave signal analysis of more than 2.5 GHz with X-Series signal analyzers. Smart features are embedded to help you to greatly simplify your overall test setup and improve the DANL and TOI of your test system. Go smart with harmonic mixing for your millimeter-wave applications.

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## N5183B MXG X-series microwave analog signal generator

The Keysight N5183B MXG is the pure and precise alternative to the analog PSG, with advantages in size and speed. It delivers the performance you need—spectral purity, output power, and more—to perform module- and system-level testing.



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## M8195A 65 GSa/s Arbitrary waveform generator

The Keysight M8195A arbitrary waveform generator (AWG) provides up to 65 GSa/s, 25 GHz bandwidth, 8 bits vertical resolution, and up to 4 channels in a 1-slot AXIe module, simultaneously. As devices and interfaces become faster and more complex, the M8195A AWG gives you the versatility to create the signals you need for digital applications, advanced research, wideband radar, satcom, and optical communications.



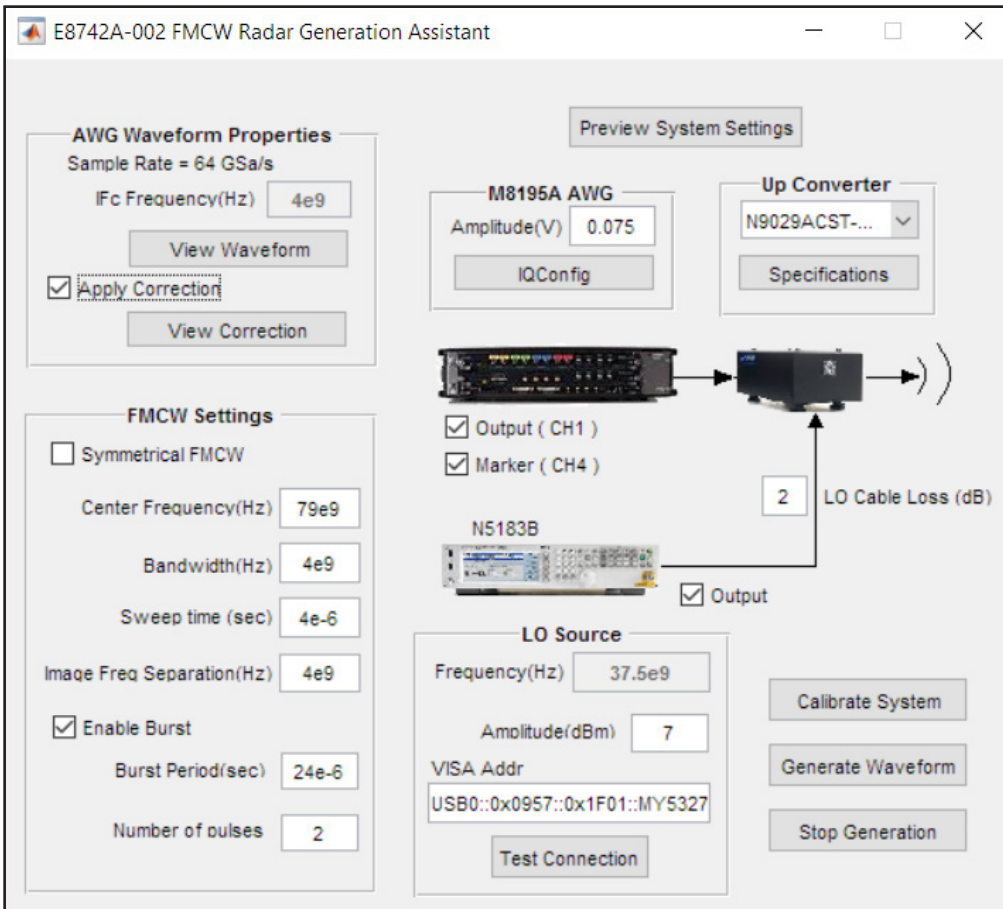
## Software

Common application software, usable with various benchtop instruments, provides users with the same measurement routines, user interfaces and programming models on benchtop solutions. The E8740A automotive radar signal analysis and generation solution uses 89601B for FMCW analysis and linearity measurement with VSA software option BHP. IQ tools enable signal creation, while RF measurement for X-Series applications is enabled by the spectrum analyzer.

### Software – Signal creation

#### IQ tools

The E8740A automotive radar signal analysis and generation solution enables multiple ways to create automotive radar signals. FMCW waveforms are generated with the IQ tools software applications.





## Custom waveforms

Custom waveforms can also be imported into the AWG using IQ tools.

## N7608C Signal studio for custom modulation

The screenshot shows the Keysight Signal Studio for Custom Modulation interface. The main window is titled "Keysight Signal Studio for Custom Modulation". The interface includes a menu bar (File, Control, System, Tools, Help), a toolbar, and a sidebar with a tree view containing "Hardware", "Instrument", "Waveform Setup", and "Custom IQ".

The "Quick Setups" section is expanded to show "1. Custom IQ Selection". Under "Custom IQ Type", "Radar" is selected. The "Radar Settings" section is also expanded, showing "Radar Type" set to "Customized Chirp". Other settings include "Sample Rate" (200,000,000 MHz), "Number of Segments" (6), and "Total Sweep Time" (8,000,000 ms).

Below the settings is a "Clear All" button and a table with the following data:

Frequency Start	Frequency End	Duration
-1.000000 MHz	-1.000000 MHz	1.000000 ms
-1.000000 MHz	1.000000 MHz	2.000000 ms
1.000000 MHz	1.000000 MHz	1.000000 ms
1.000000 MHz	0 Hz	1.000000 ms
0 Hz	1.000000 MHz	1.000000 ms
1.000000 MHz	-1.000000 MHz	2.000000 ms

Below the table is the "Radar Type" section, which includes the text "Select the radar type. Choices: FMCW | MFSK | Customized Chirp. Default: FMCW".

At the bottom of the interface is a waveform plot showing a red line representing a chirp signal. The y-axis is labeled "f" and ranges from -1.00 MHz to 1.00 MHz. The x-axis is labeled "t" and shows a time scale with markers at 1.00 ms, 2.00 ms, 1.00 ms, 1.00 ms, 1.00 ms, and 2.00 ms. The waveform starts at -1.00 MHz, rises to 1.00 MHz, stays there for a short duration, falls back to 0 Hz, stays there for a short duration, rises to 1.00 MHz, stays there for a short duration, and finally falls back to -1.00 MHz.

The status bar at the bottom left shows "Ready" and "Not connected".

## Custom IQ

- Set parameters such as custom IQ constellation settings for BPSK, QPSK, 8PSK,OOK, 2/4/8 ASK, 16-4096QAM, 2/4/8/16 FSK, MSK, S-OQPSK, AM/FM/PM, FMCW, MFSK, Customized chirp, or user-defined constellations
- Use customizable quick setups for DVB-S2X, APCO25, TETRA, NXDN, dPMR, DECT, DMR, ARIB, 802.15.4 (BPSK, O-QPSK), 802.15.4g (Wi-SUN), ITU-T G.9959 and more
- Set parameters such as symbol rate, payload data sequence (PN, custom, user file), data length, and shaping filter characteristics

## Software – Signal analysis

### X-Series measurements applications for MXA and UXA instruments

The X-Series measurement applications support standards-based RF transmitter tests. Fast RF conformance measurements help you evaluate and manufacture your devices and equipment. Key measurements enabled include:

- RF Power
- Spectrum emissions
- Phase noise
- Frequency stability
- Modulation quality

## FMCW Radar Analysis

The Keysight 89600 VSA software is a comprehensive set of tools for signal demodulation, vector signal analysis and time domain analysis. Option BHP for frequency modulated continuous wave (FMCW) radar analysis helps R&D and design verification test engineers quickly and easily make automated modulation quality measurements on multi-chirp linear FM signals according the evolving requirements for radar sensor performance and detection techniques in automotive, aerospace and defense applications. The new 89601B-BHP FMCW option provides signal synchronization, quick access to multiple FMCW modulation domain result traces, metrics, statistics, histograms and trend lines. 89600 VSA software with Option BHP provides design engineers more insight into and confidence in product design and quality in a shorter test time and accelerates time to market.

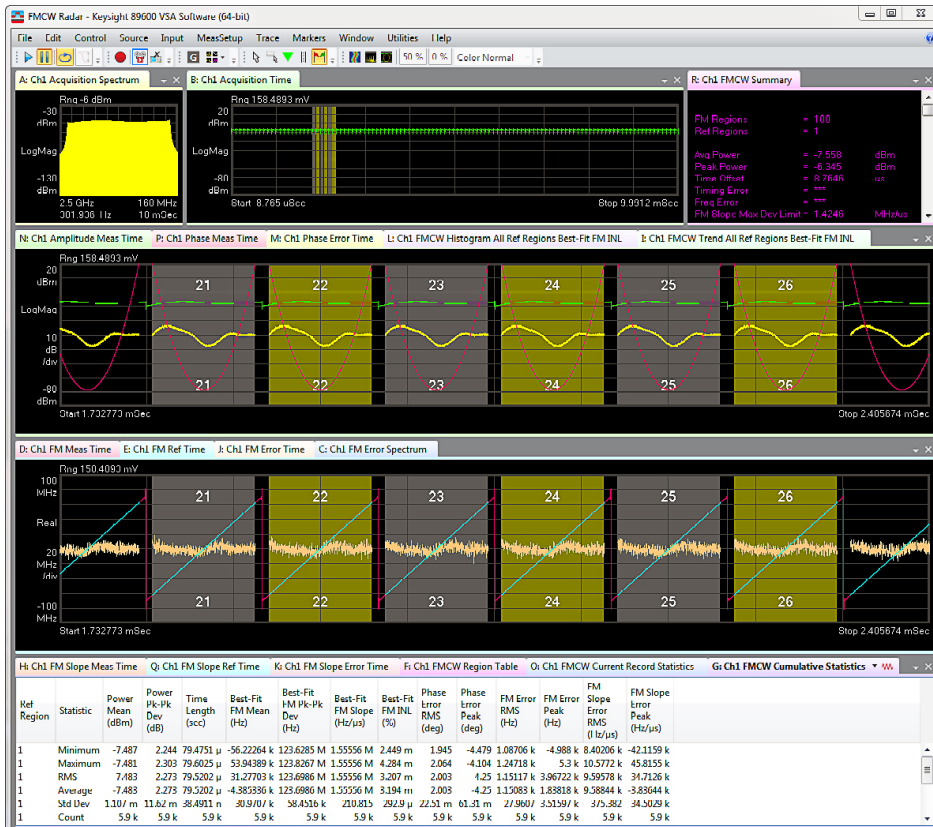


Figure 1. Spectrum and time domain results on multi-chirp FM signals, highlighting six selected FM regions (number 21 through 26) in synchronized time domain traces. The FMCW cumulative statistic table below provides accumulated results over all detected regions.

- Analyze frequency modulated continuous wave (FMCW) radar signals used in automotive radar, industrial, surveillance, aerospace and defense radar applications

- Automatically synchronize to FMCW radar signals comprised of multi-chirp linear FM modulation patterns

- Visualize FMCW signal modulation characteristics and impairment errors within the synchronized amplitude, phase, frequency (FM) and frequency slope (FM Slope) trace results

- Verify all key FMCW signal modulation performance indicators relating to power, time, phase, frequency (FM) and frequency slope rate using a comprehensive FMCW region table

- Accumulate performance data statistics for each reported FMCW metric over single or multiple acquisitions using the FMCW current record statistics and cumulative statistics, along with graphical histogram and trend line trace plots

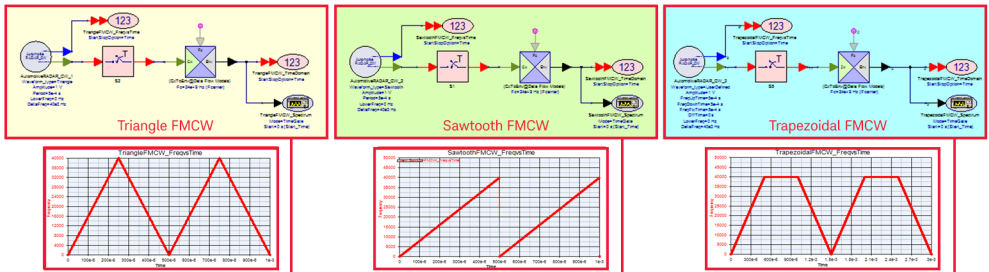
- Gain deeper insight into your signal's time and frequency dynamic and spurious performance with powerful and flexible trace views such as spectrogram and cumulative history

# W1908 SystemVue Automotive Radar Library

Complete set of highly-parameterized simulation models and reference designs for automotive radar scenario simulation

The Keysight EEsof EDA SystemVue W1908 automotive radar library has comprehensive tools for frequency modulated continuous-wave (FMCW) radar waveform generation, signal modulation, antenna modeling, channel simulation and signal processing. Users can simply connect different models to establish the unique automotive radar simulation scenarios. Meanwhile, the reference designs, such as multi-targets range and speed measurement and 3D scanning radar using antenna array, offer users much easier starting points to implement their own design ideas into early simulations and prototyping.

## Keysight EDA SystemVue Automotive Radar Library



Download waveform from SystemVue

### Signal Generation with Upconversion



M8195A  
65 GSa/s arbitrary waveform generator



VDI compact converter



M8190A  
12 GSa/s arbitrary waveform generator



E8267D PSG  
Low phase noise LO

## Recommended Solution Configuration <sup>1</sup>

Model	Description	Comments
E8740A-010	Radar RF signal analysis with N9020B, M1971E	
E8740A-011	Radar RF signal analysis with N9020B for resolution bandwidth extended, M1971E	Other components will be selected and accessories, for SA, selects E8740A-S02 instead of E8740A-S03
E8740A-020	Basic radar signal analysis with DSOS604, M1971E, N5138B with 89601B VSA software and FMCW radar analysis assistant	
E8740A-030	Basic Plus radar signal analysis with DSOS604, N9029AV12, N5138B with 89601B VSA software and FMCW radar analysis assistant	
E8740A-040	Advanced radar signal analysis with N9020B, DSOS604, M1971E with 89601B VSA software	
E8740A-041	Advanced radar signal analysis with N9020B for resolution bandwidth extended, DSOS604, M1971E with 89601B VSA software	Other components will be selected; for SA accessories, select E8740A-S03 instead of E8740A-S04
E8740A-050	Advanced Plus radar signal analysis with N9020B, DSOS604, N9029AV12, N5183B with 89601B VSA software and FMCW radar	
E8740A-051	Advanced Plus radar signal analysis with N9020B for resolution bandwidth extended, DSOS604, N9029AV12, N5183B with 89601B VSA software	Other components will be selected; for SA accessories, select E8740A-S03 instead of E8740A-S04
E8740A-060	Performance radar signal analysis with N9041B, DSOS804 with 89601B VSA software	
E8740A-061	Performance radar signal analysis with N9041B with 1 GHz BW on-board analysis, DSOS804 with 89601B VSA software	Other components will be selected; for SA accessories, select E8740A-S01 instead of E8740A-S02
E8740A-062	Performance radar signal analysis with N9041B, DSOS804 with 89601B VSA software	Other components will be selected; for SA accessories, select E8740A-S06
E8740A-063	Performance radar signal analysis with N9041B with 1 GHz BW on-board analysis, DSOS804 with 89601B VSA software	Other components will be selected; for SA accessories, select E8740A-S05
E8740A-070	Performance radar signal generation	

## Software selections

Model	Description	Comments
89601B-200	Basic VSA and hardware connectivity	
89601B-BHP	FMCW radar analysis	
E8742A-001	FMCW radar analysis assistant (VSA Utility)	
E8742A-002	FMCW radar generation assistant (IQTools Utility)	

- For a more complete set of configuration options, please refer to the E8740A Automotive Radar Signal Analysis and Generation Solution configuration guide, literature part number 5992-2630EN,