

E8719A Radar Target Simulator

76 to 81 GHz, 5 GHz Instantaneous BW, imaging radar ready

Today and Next Generation Radars

76 – 77 GHz band radars have been available in the market for many years now and is the dominant automotive radar sensor being manufactured today. In place of the older 24 GHz short range radars, the 77 – 81 GHz radars are gaining traction with a significant amount of investment placed to take advantage of the wider bandwidth (BW) giving the radar sensor the improved resolution and full imaging capability. Boosted further with advance processing capabilities and the inclusion of AI, the future is looking bright for automotive radar sensors.

Target simulators

Be it long- or short-range radar sensors, the applicable frequency range from 76 – 81 GHz is wide. Test setups have been just-enough, most manufactured radar sensors at this point had a narrow BW, typically from 800 MHz to 1 GHz. As described above, this is quickly changing with increasingly wider BWs being applied. Keysight was among the first to release the 4 GHz wide target simulator from 77 – 81 GHz, and now expanding it further to cover the full 76 – 81 GHz with 5 GHz of instantaneous bandwidth and ready to take on the challenge of any radar sensor within this frequency band on the market.

E8719A radar target simulator

The Keysight E8719A Radar Target Simulator, with full 5 GHz of instantaneous bandwidth includes improved distance accuracy of 5 cm, aligning to the performance expectations from future imaging radars. A new over-the-air calibration feature has also been included to improve path loss and minimize uncertainties in radar test setups, please refer to the comprehensive *E8719A Radar Target Solution Guide* for more information.



Figure 1. E8719A Radar Target Simulator with 5 GHz instantaneous bandwidth

Specifications

System base configuration ¹	E8719A-C01 (Single target)	E8719A-C03 (Multi target)
Frequency range (Instantaneous Bandwidth)	76 to 81 GHz (5 GHz)	
Number of Targets	1	3
Target Distance Type	Variable distance	1 x Variable distance 2 x Fixed distance
Channel 1 target distance simulation		
Min. simulated target distance (0.5m IF cable)	(physical) + 3 m (simulated) ²	
Min. simulated target distance (2.0m IF cable) ³	(physical) + 5 m (simulated) ²	
Max. simulated target distance / steps	300 m / 0.01 m ¹	
Distance accuracy	+ / - 0.05 m	
Channel 2 and 3 target distance simulation		
Note: Customer defines the distance required, and the delay/distance will be matched		
Min. simulated target distance (only 2.0m cable)	(physical) + 5 m (simulated) ²	
Max. fixed distance	300 m	
Distance accuracy (Channel 2 and 3)	+ / - 0.3m	
Input power		
Max. input power (at RF flange)	0 dBm	
Recommended input power (at RF flange)	- 20 dBm	
Radar cross section simulation (RCS) and other RF performance specifications		
Transmit / Receive Gain Control for RCS	> 80 dB ⁴	
Internal IF Frequency	3.92 GHz to 8.92 GHz	
Signal Flatness (Channel 1 – full 5 GHz BW)	+ / - 2dB	
In-band spurious signals	< -40 dBc ⁵	
Doppler simulation range / step	+ / - 500 km/h / 0.1 km/h	
Doppler simulation accuracy	+ / - 0.05 km/h	
Tx / Rx Isolation		
<ul style="list-style-type: none"> • Bi-static • Mono-static 	> 50 dB (typical) > 20 dB (typical – max. 30 dB)	

1. Specific design can be considered for different customer needs
2. Optional bracket is available with each front end, adds additional 0.2m distance to total simulated distance
3. Cable lengths can be customized, please contact Keysight
4. Test setting dependent e.g. range and DUT power
5. Measured at minimum distance and static target with -25 dBm input

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