

Active Radiated Emissions Horn Antenna

AH40G

Preamplified Broadband Receive System | 18 GHz to 40 GHz

The AH40G is an active dual-ridge horn receive system for high-frequency EMC and microwave measurements. The assembly integrates a broadband horn antenna, low-noise preamplifier, RF output interface, DC power input, and tripod-compatible mechanical support.



Antenna Model
AH40G
Active Radiated Emissions
Horn Antenna

Features

- Frequency Range:** 18 GHz to 40 GHz
- Gain:** 12.8 to 23.7 dB
- Antenna Factor:** 33 to 49 dB/m calculated
- Noise Figure:** 3.2 dB
- VSWR:** 1.566:1
- Power Supply:** +12 VDC
- Connector:** 2.92 mm (K)

Applications

- Radiated emissions pre-compliance and engineering measurements.
- EMC chamber checks and broadband receive measurements.
- Microwave/mmWave laboratory testing from 18 GHz to 40 GHz.
- Satellite communications, radar, and high-frequency system troubleshooting.

Configuration

Description	Value
Product Type	Active radiated emissions horn antenna / preamplified receive system
Frequency Range	18 GHz to 40 GHz
Pattern	Directional
Polarization	Linear
RF Output Interface	K / 2.92 mm class output interface
DC Power Input	+12 VDC nominal external supply

Electrical Specifications

Description	Minimum	Typical	Maximum	Units
Frequency Range	18		40	GHz
Calculated boresight realized receive gain	12.8	19.8	23.7	dB
Output VSWR, system RF output	1.057:1	1.566:1 average	2.323:1	
S11 output return loss	-31.08	-14.39	-8.00	dB
Measured band meeting -10 dB S11 target		91.5		%
Low-noise amplifier noise figure		4 typical		dB
LNA maximum RF input rating			-10	dBm
DC power input		+12 nominal		VDC
Thermal rise over 2 hours		+4.7		degF

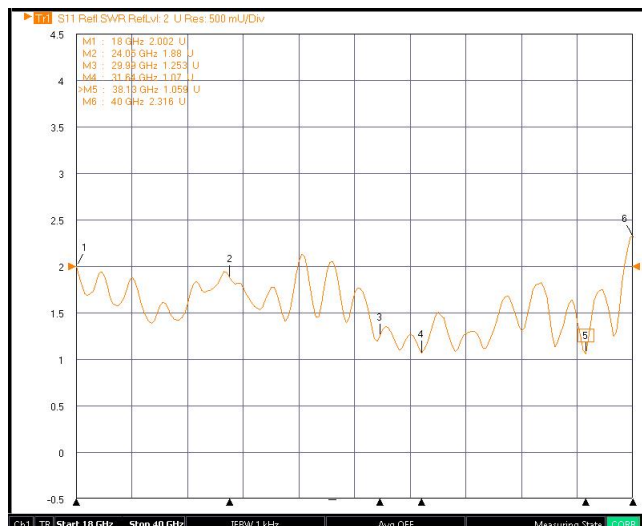
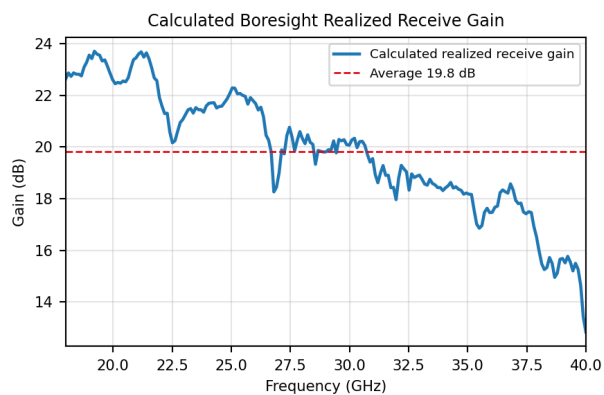
Performance by Frequency

Frequency	Calculated realized gain	Output VSWR	S11 return loss	Units
18.00	22.6	2.002:1	-9.41	GHz / dB / dB
24.05	21.7	1.880:1	-10.25	GHz / dB / dB
29.99	20.1	1.253:1	-19.00	GHz / dB / dB
31.64	18.9	1.070:1	-29.52	GHz / dB / dB
38.13	15.5	1.059:1	-30.67	GHz / dB / dB
40.00	12.8	2.316:1	-8.01	GHz / dB / dB

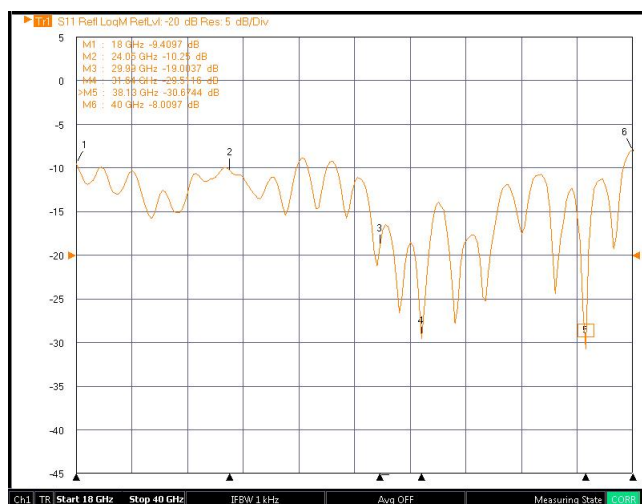
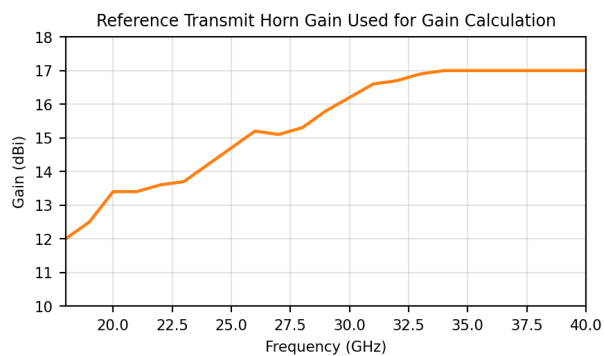
Reference Antenna and Measurement Conditions

Parameter	Condition
Reference transmit antenna	Transmitting horn antenna, 18-40 GHz
Reference antenna nominal gain	12 to 17 dBi typical
Transmit/receive separation	1 m
Boresight orientation	0 deg receive angle
Receive output measurement	AH40G system RF output port

Typical Performance Data



Measured output VSWR sweep, 18 GHz to 40 GHz.

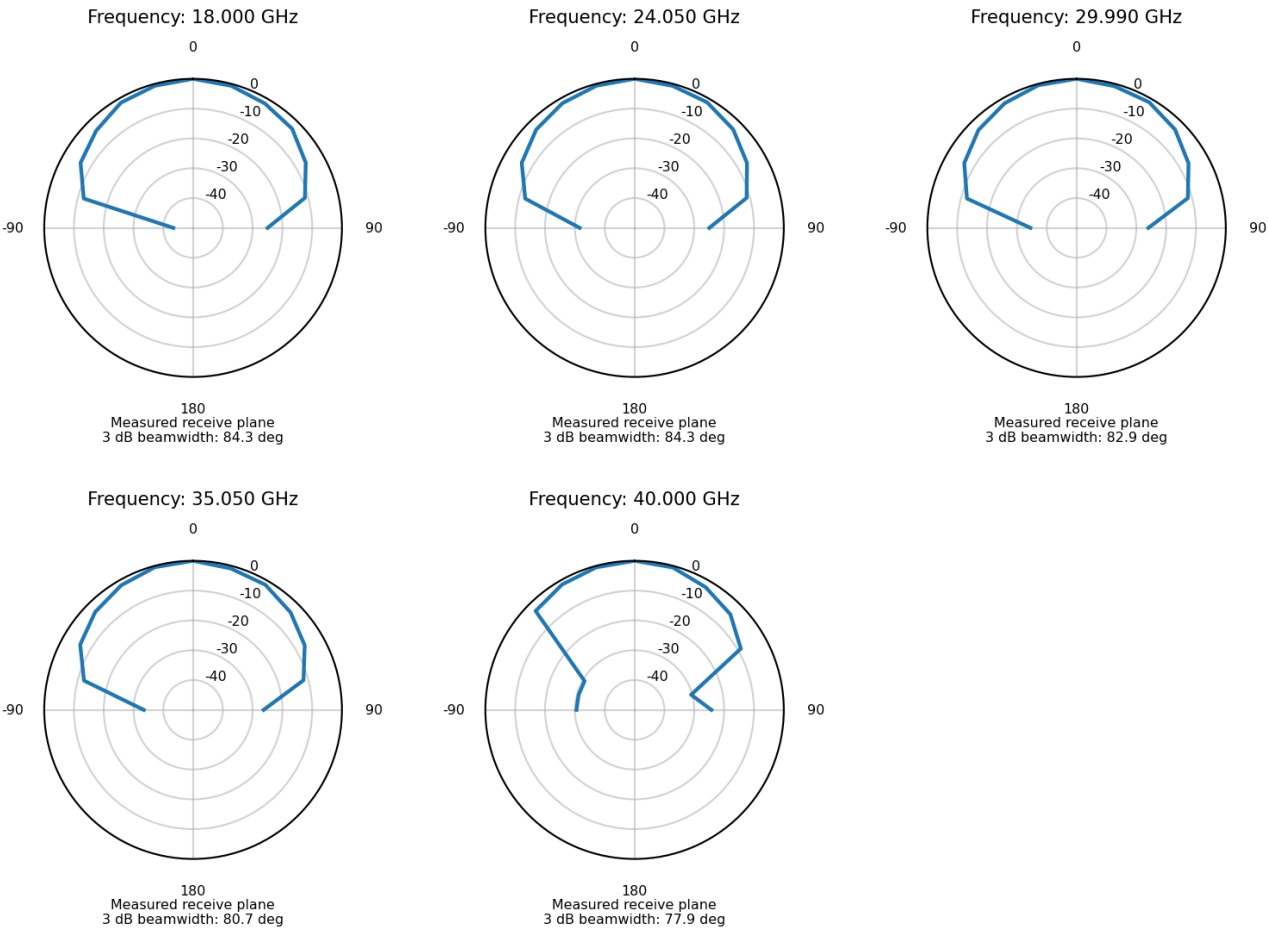


Measured S11 output return loss, 18 GHz to 40 GHz.

Summary: Realized gain ranges from 12.8 dB to 23.7 dB across the measured band. Output VSWR averages

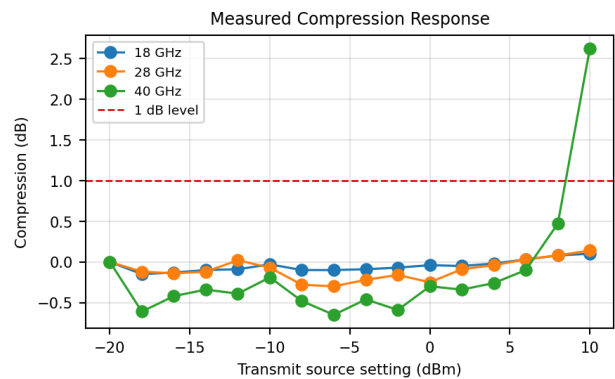
Radiation Pattern Data

The plots below are normalized to the 0 deg boresight response and generated from the measured receive-plane angle sweep. The available measured sweep covers -90 deg to +90 deg.

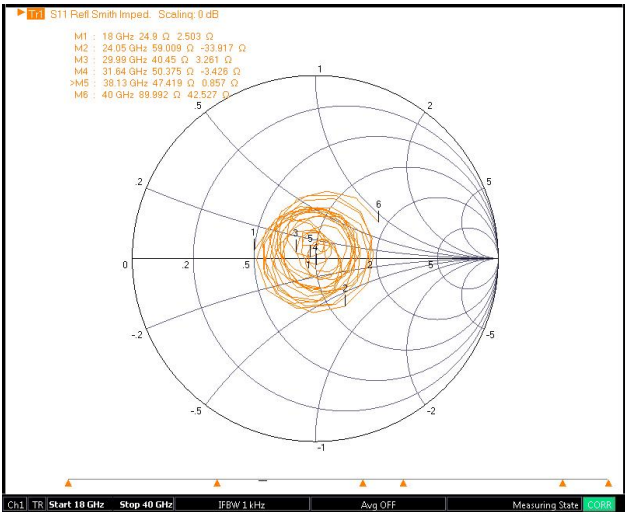


Frequency	3 dB Beamwidth	Notes
18.00	84.3	Measured receive plane, normalized to boresight
24.05	84.3	Measured receive plane, normalized to boresight
29.99	82.9	Measured receive plane, normalized to boresight
35.05	80.7	Measured receive plane, normalized to boresight
40.00	77.9	Measured receive plane, normalized to boresight

Compression and Output Match



Measured compression response at 18 GHz, 28 GHz, and 40 GHz.



Measured output impedance centered near 50 ohms across the band.

Frequency	Observed Compression Behavior
18 GHz	No 1 dB compression observed through +10 dBm transmit source setting
28 GHz	No 1 dB compression observed through +10 dBm transmit source setting
40 GHz	Limiting case; compression increases near the upper end of the drive sweep

System Details



Architecture

Incident RF energy enters the horn aperture, is amplified by the integrated low-noise amplifier, and is delivered to the system RF output connector for connection to a receiver, spectrum analyzer, or measurement chain.

Subsystem	Description
Broadband horn antenna	Dual-ridged horn, 18-40 GHz, K(F) RF port
Low-noise amplifier	18-40 GHz integrated LNA, +12 VDC bias
RF output path	Internal K-class jumper to panel RF output connector
Mechanical support	Horn mount, enclosure support, and tripod-compatible base

Thermal Performance

Time Interval	Center Temperature	Observation
5 minutes	76.2 degF	Initial warm-up
30 minutes	78.9 degF	Approaching thermal equilibrium
1 hour	79.8 degF	Near steady-state
2 hours	80.9 degF	Thermal equilibrium confirmed

Total measured temperature rise was 4.7 degF over two hours under continuous operation. Passive thermal management is adequate for the measured configuration.

General Notes

Specifications are based on measured data from the AH40G system RF output port and component-level reference data for the transmit antenna used during gain calculation. Performance may vary with final cable length, connector torque, measurement distance, chamber conditions, and receive-chain configuration.