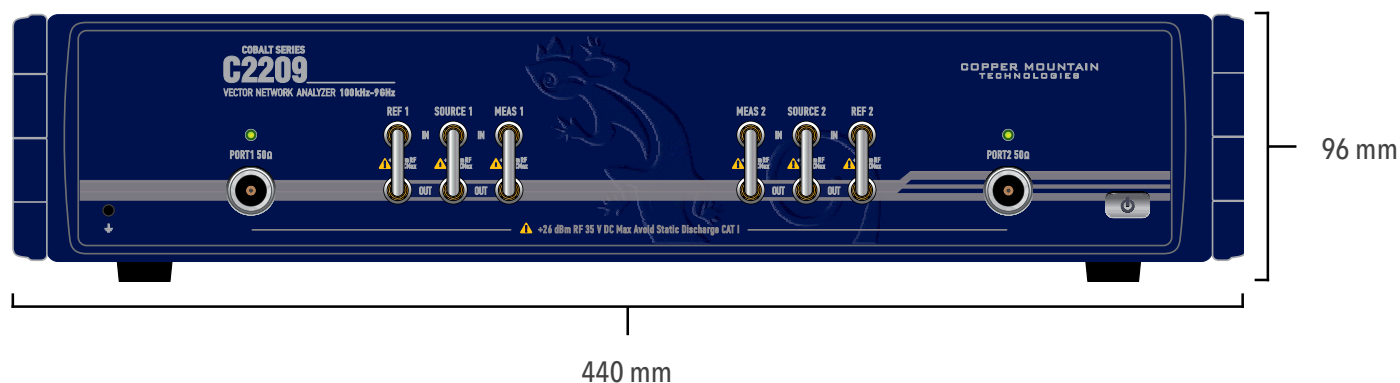


# C2209 Specifications<sup>1</sup>



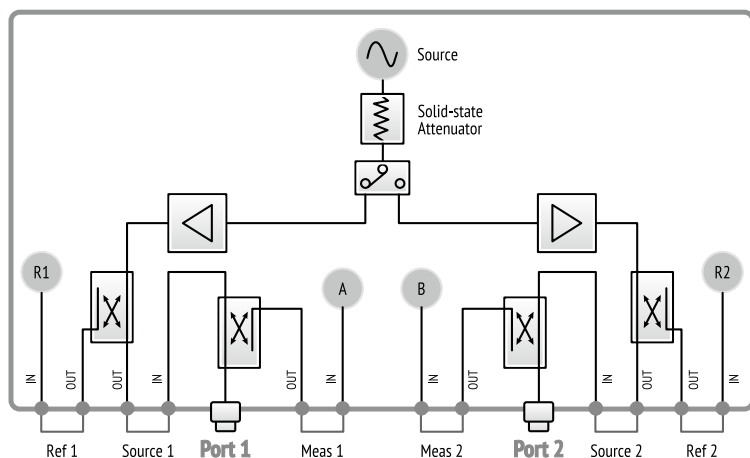
## Primary Specifications

|                                                 |                            |
|-------------------------------------------------|----------------------------|
| Impedance                                       | 50 Ohm                     |
| Test port connector                             | N-type Female              |
| Number of test ports                            | 2                          |
| Direct access                                   | Yes; Source, Ref, and Meas |
| Frequency range                                 | 100 kHz to 9.0 GHz         |
| Full CW Frequency                               | $\pm 2 \times 10^{-6}$     |
| Frequency setting resolution                    | 1 Hz                       |
| Number of measurement points                    | 2 to 500,001               |
| Measurement bandwidths with 1/1.5/2/3/5/7 steps | 1 Hz to 2 MHz              |
| Dynamic range                                   |                            |
| 100 kHz to 1 MHz; 1 Hz IF BW                    | 115 dB                     |
| 1 MHz to 8 GHz; 1 Hz IF BW                      | 158 dB/162 dB, typ.        |
| 8 GHz to 9 GHz; 1 Hz IF BW                      | 148 dB/152 dB, typ.        |
| Time per point (Typ.)                           | 10 $\mu$ sec               |
| Port switchover time (Typ.)                     | 0.2 msec                   |

## Measurement Accuracy

| Transmission <sup>2</sup>           | (Magnitude/Phase)             |
|-------------------------------------|-------------------------------|
| 100 kHz to 1 MHz                    |                               |
| 5 dB to 15 dB                       | 0.2 dB/2°                     |
| -30 dB to 5 dB                      | 0.1 dB/1°                     |
| -50 dB to -30 dB                    | 0.2 dB/2°                     |
| -70 dB to -50 dB                    | 1.0 dB/6°                     |
| 1 MHz to 8 GHz                      |                               |
| 5 dB to 15 dB                       | 0.2 dB/2°                     |
| -70 dB to 5 dB                      | 0.1 dB/1°                     |
| -90 dB to -70 dB                    | 0.2 dB/2°                     |
| -110 dB to -90 dB                   | 1.0 dB/6°                     |
| 8 GHz to 9 GHz                      |                               |
| 5 dB to 15 dB                       | 0.2 dB/2°                     |
| -60 dB to 5 dB                      | 0.1 dB/1°                     |
| -80 dB to -60 dB                    | 0.2 dB/2°                     |
| -100 dB to -80 dB                   | 1.0 dB/6°                     |
| Reflection                          | (Magnitude/Phase)             |
| -15 dB to 0 dB                      | 0.4 dB/3°                     |
| -25 dB to -15 dB                    | 1.0 dB/6°                     |
| -35 dB to -25 dB                    | 3.0 dB/20°                    |
| Trace noise magnitude (3 kHz IF BW) |                               |
| 100 kHz to 1 MHz                    | 0.005 dB RMS                  |
| 1 MHz to 9 GHz                      | 0.001 dB RMS                  |
| Temperature dependence              | 0.020 dB/°C, 0.010 dB/°C typ. |

## Schematic Diagram of Cobalt C2209



## Effective System Data

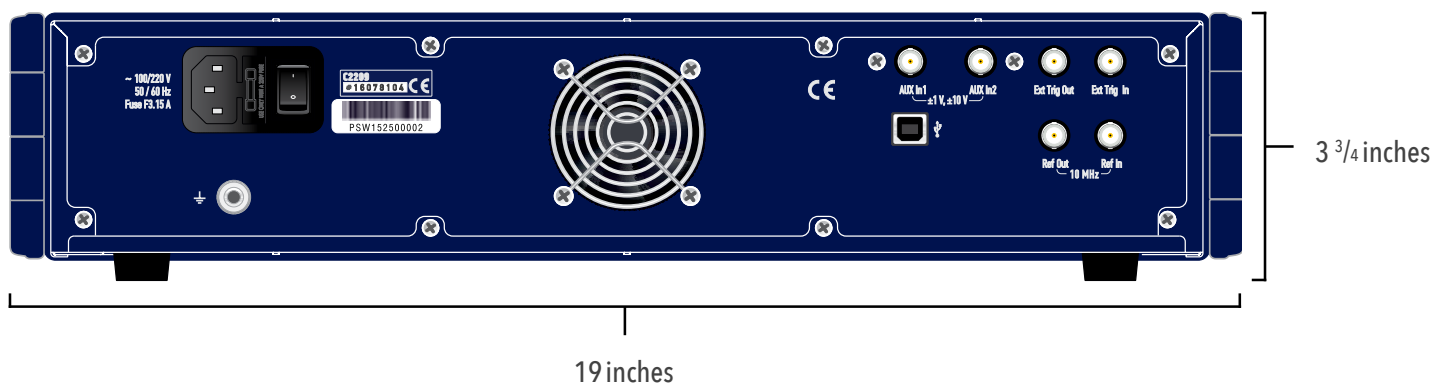
|                        |       |
|------------------------|-------|
| Effective directivity  | 46 dB |
| Effective source match | 40 dB |
| Effective load match   | 46 dB |

## Test Port

| Directivity (without system error correction) |       |
|-----------------------------------------------|-------|
| 100 kHz to 1 MHz                              | 12 dB |
| 1 MHz to 9 GHz                                | 15 dB |

[1] All specifications subject to change without notice.

[2] At 23 °C  $\pm$  5 °C after warmup time, with  $\pm$  1 °C ambient deviation from calibration temperature, at high output power



## Test Port Output

|                                         |                    |
|-----------------------------------------|--------------------|
| Match (without system error correction) |                    |
| 100 kHz to 1 MHz                        | 12 dB              |
| 1 MHz to 9 GHz                          | 15 dB              |
| Power Range                             | -60 dBm to +15 dBm |
| Power Accuracy                          | ±1.5 dB            |
| Power Resolution                        | 0.050 dB           |
| Harmonic distortion (Power out 0 dBm)   | -25 dBc            |
| Non-harmonic spurious (Power out 0 dBm) | -30 dBc            |

## Test Port Input

|                                         |             |
|-----------------------------------------|-------------|
| Match (without system error correction) |             |
| 100 kHz to 1 MHz                        | 12 dB       |
| 1 MHz to 9 GHz                          | 15 dB       |
| Damage Level                            | +26 dBm     |
| Damage DC Voltage                       | 35 V        |
| Noise Floor                             |             |
| 100 kHz to 1 MHz                        | -100 dBm/Hz |
| 1 MHz to 8 GHz                          | -143 dBm/Hz |
| 8 GHz to 9 GHz                          | -133 dBm/Hz |

## Measurement Speed

| Number of points (IF bandwidth 1 MHz) | Uncorrected | 2-Port Calibration |
|---------------------------------------|-------------|--------------------|
| 51                                    | 1.0 ms      | 2.0 ms             |
| 201                                   | 2.6 ms      | 5.0 ms             |
| 401                                   | 4.6 ms      | 9.0 ms             |
| 1601                                  | 16.7 ms     | 33.3 ms            |

## External Reference Input

|                                      |                 |
|--------------------------------------|-----------------|
| Connector type                       | BNC Female      |
| External reference frequency         | 10 MHz          |
| Input level                          | -2 dBm to 4 dBm |
| Input impedance at <<Ref IN 10 MHz>> | 50 Ohm          |

## External Reference Output

|                                                   |                |
|---------------------------------------------------|----------------|
| <<OUT 10 MHz>> connector type                     | BNC Female     |
| Output reference signal level at 50 Ohm impedance | 0 dBm to 2 dBm |

## External Trigger Input

|                                    |                      |
|------------------------------------|----------------------|
| Type                               | BNC, Female          |
| Input level low threshold voltage  | 0.8 V                |
| Input level high threshold voltage | 2.7 V                |
| Input level range                  | 0 to 5 V             |
| Pulse width                        | 2 µsec               |
| Polarity                           | Positive or Negative |

## External Trigger Output

|                                     |                      |
|-------------------------------------|----------------------|
| Type                                | BNC, Female          |
| Maximum output current              | 20 mA                |
| Output level low threshold voltage  | 0.4 V                |
| Output level high threshold voltage | 3.0 V                |
| Polarity                            | Positive or Negative |

## System & Power

|                       |                                |
|-----------------------|--------------------------------|
| Operating temperature | 5°C to 40°C (41°F to 104°F)    |
| Storage temperature   | -50°C to 70°C (-58°F to 158°F) |
| Humidity              | 90% at 25°C (77°F)             |
| Atmospheric pressure  | 84.0 kPa to 106.7 kPa          |
| Power Supply          | 110-240 V, 50-60 Hz            |
| Power Consumption     | 40.0 W                         |
| Weight                | 7.0 kg/247 oz                  |

## Factory Adjustment

|                                         |         |
|-----------------------------------------|---------|
| Recommended Factory Adjustment Interval | 3 Years |
|-----------------------------------------|---------|

## Direct Receiver Access Ports

|                               |         |
|-------------------------------|---------|
| Maximum input, Ref 1&2        | -3 dBm  |
| Maximum input, Source 1&2     | 15 dBm  |
| Maximum input, Meas 1&2       | -3 dBm  |
| Damage level, Ref 1&2         | 13 dBm  |
| Damage level, Source 1&2      | 26 dBm  |
| Damage level, Meas 1&2        | 13 dBm  |
| Damage DC voltage, Ref 1&2    | 0 V DC  |
| Damage DC voltage, Source 1&2 | 35 V DC |
| Damage DC voltage, Meas 1&2   | 0 V DC  |