Circular Orbit Operating Mode for MEMS Gyroscopes
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Circular Orbit Operation

- Drive both axes in quadrature
- Frequency-modulated rate readout

Bias Stability

Statistic Value | Single | Dual
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Angle random walk (deg/s/√Hz) | 0.128 @ 0.03 s | 0.089 @ 0.03 s
Allan bias deviation (deg/hr) | 1547 @ 0.3 s | 4000 @ 8.2 s

Temperature Characterization

- Temperature dependence = 27 ppm/K
- Relative frequency tracking error = 6 ppb

Architecture

Quadrature Drive & Rate Readout

Measurement Results

Electronics Noise

- Input referred displacement noise < 50 fm/Hz
- Input referred capacitance noise < 1.2 zF/Hz

Device Photos

Ring Gyro

Dual-Mass Gyro

Dual-Gyro Mode

Electronics

Sensing Circuits

Sensing Amp.