

### GENERAL DESCRIPTION

The ICG-1020P and ICG-1021P dual-axis MEMS angular rate sensors are designed for optical image stabilization (OIS) applications in smartphone camera modules and other mobile devices.

The ICG-1020P provides small 2.3x2.3mm<sup>2</sup> package with 0.65mm thickness where the ICG-1021P offers the same performance in an extremely thin package with 0.5mm package height.

Both ICG-1020P and ICG-1021P support an innovative approach of allowing the ODR to vary slightly to provide lower RMS noise than the already benchmark level of ICG-1020S and ICG-1021S devices.

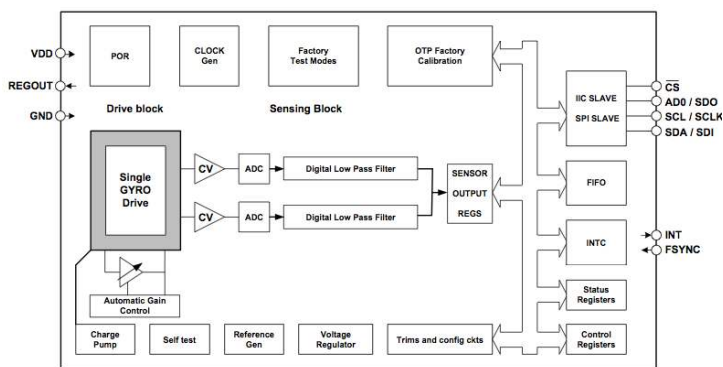
The high-resolution gyros support a programmable full-scale range of  $\pm 46.5$  dps to  $\pm 374$  degrees/sec, fast sample rate at up to 32 KHz, low phase delay including a fast 20 MHz SPI interface, very low rate noise at 3.5 mdps/VHz, and extremely low power consumption at 2.5 mA. Precise sensitivity control allows a calibration-less strategy for gyroscope to save production cost and time by eliminating the shake table.

### ORDERING INFORMATION

PART	AXES	TEMP RANGE	PACKAGE
ICG-1020P+	X,Y	-40°C to +85°C	12-Pin LGA
ICG-1021P+	X,Y	-40°C to +85°C	12-Pin LGA

†Denotes RoHS and Green-Compliant Package

### BLOCK DIAGRAM



### APPLICATIONS

- Smart Phone Camera Modules
- Digital Still Camera and Video Cameras
- High Resolution / Low Noise Applications

### FEATURES

- ICG-1020P: Small 2.3 x 2.3 x 0.65 mm LGA Package
- ICG-1021P: Thin 2.3 x 2.3 x 0.5 mm LGA Package
- Very Low 3.5 mdps/VHz Rate Noise
- Extremely tight sensitivity eliminates OIS dynamic calibration
- Fully programmable Low-pass filters to 1500 Hz
- Drop-in replacement for IDG-2030U
- Resistant to 36kHz to 40kHz ultrasonic wash frequencies
- Fully programmable High-pass filters at 0.05 to 10Hz to remove offset drift due to temp & PCB warp
- Sense Peak Frequency tolerance and Fdrive values are stored in OTP
- Independent ODR v. LPF selection for the most optimized performance
- Narrow FSR Range from  $\pm 46.5$  dps to  $\pm 374$  dps
- High Resolution at up to 700 LSB/(°/s)
- Fast Start up Time; Sleep to Ready at 25 ms
- Fast 20 MHz (3 & 4 wire) SPI Interface
- Temperature sensor for offset temp compensation
- Wide 1.71V to 3.6V Supply Voltage Range
- Low 5mW Active Power & 6µA Sleep Mode
- Self-test allows quick gyro functionality check
- High 10,000g Shock Survivability

### TYPICAL OPERATING CIRCUIT (TOP VIEW)

