Ensigma™ Location is a family of high-performance and low power IP solutions for Global Satellite Navigation Systems (GNSS). The IP is specifically designed to meet the location requirements for the low-power consumption markets such as the Internet of Things (IoT) and wearables. Ensigma Location solutions implement all of the requirements for complex low-power System on Chip (SoC).

The Ensigma Location GNSS IP core supports GPS, GLONASS, Galileo, and BeiDou as well as several Satellite-Based Augmentation Systems (SBAS) including WAAS and EGNOS. The Ensigma GNSS incorporates an ultra-low power CPU core and dedicated hardware blocks which enable lower power consumption. GNSS IP not only supports continuous fix techniques, but it also supports power-efficient ‘capture and process’ for devices that only require periodic location updates. This feature conserves battery life by capturing data for post-processing without the RF active. The baseband uses several algorithmic optimisations to deliver the lowest active and idle power. This extends the system battery life while maintaining consistent location information providing a rich set of features.

Ensigma GNSS IP can be configured for lowest power or highest integration, and is designed to fit into any existing solution with the optimum level of design and resource re-use.

**Features**
- Flexible Multi–Constellation Support
- Low Power Consumption
- High Sensitivity
- LTE Integration
- Low Cost
- Robustness/Integrity
- Small die area

**Benefits**
- Complete Baseband IP solution
- End to End Solution with partner Tuner/RF
- Easy integration into an SoC

**Applications**
- IoT sensors and edge devices
- Wearables
- Consumer mobile products
- Asset tracking devices
General Features
- Support for standard constellation features.
  - Push to fix operation
  - Intermittent positioning on command (external/internal)
- Supports Assisted GNSS
  - Improves sensitivity / TTFF
  - Position, time, frequency
- Constellation data (Ephemeris/lnono/UTC data)
- LTE TCXO sharing for reduced eBOM cost
- LTE memory sharing for reduced silicon area cost.
- RF capture and process
  - RF is on for minimum time with samples post processed for optimised power consumption
- Processing Scales with Clock Rate
- Captured RF samples can be stored in memory
- Timing system allows LTE time and frequency references to be shared with GNSS system

Low Power Consumption
- Minimised RF power consumption during one shot fixing mode by allowing capture of the RF signal to RAM (along with background processing capability with the RF off).
- Minimised RF consumption and processing requirement in the baseband with duty cycling of tracking operations.
- Reduced signal sample rates to a minimum to allow reduced baseband processing.

High Sensitivity
- Maximising use of memory and processing to recover maximum sensitivity.

Interfaces
- Digital I/Q Interface to Tuner
- Tuner control by host or GNSS Subsystem
- Interface to Host Processor
- Serial port receives commands from host and carries tracking data to host
- 32-bit AXI slave port optionally provides host access to internal shared memory
- Interface to External Memory
- 32-bit AXI master port gives the GNSS system access to external memory

GNSS Constellation Support

<table>
<thead>
<tr>
<th>Constellation</th>
<th>Band</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS</td>
<td>L1</td>
<td>(1575.42 MHz)</td>
</tr>
<tr>
<td>GLONASS</td>
<td>L1</td>
<td>(1602.0 MHz)</td>
</tr>
<tr>
<td>Beidou</td>
<td>B1</td>
<td>(1561.098 MHz)</td>
</tr>
<tr>
<td>Galileo</td>
<td>E1</td>
<td>(1575.42 MHz)</td>
</tr>
</tbody>
</table>

Part Code Description

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