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Easily Integrate Position, Navigation and Timing Technology With Microchip's Portfolio of GNSS Disciplined Oscillator Modules

These high-performance, small-form-factor timing systems are designed for defense applications in GNSS-denied environments

CHANDLER, Ariz., Aug. 28, 2025 (GLOBE NEWSWIRE) -- Aerospace and defense applications rely on Position, Navigation and Timing (PNT) technology for mission-critical accuracy and reliability. However, integrating PNT into a design requires extensive domain knowledge in this area. To fast track the development process, Microchip Technology **(Nasdaq: MCHP)** today announces its portfolio of **GNSS Disciplined Oscillator (GNSSDO) Modules** that integrate the company's renowned embedded atomic clock and oscillator technologies, including the Chip-Scale Atomic Clock (CSAC), Miniature Atomic Clock (MAC) and Oven-Controlled Quartz Crystal Oscillators (OCXOs).

The GNSSDO modules process reference signals from GNSS or an alternative clock source and disciplines the on-board oscillator to the reference signal, enabling precise timing, stability and holdover performance based on end application requirements. These GNSSDOs are used in military and defense applications such as radar, satellite communications (SATCOM), mounted and dismounted radios, vehicle platforms and other critical PNT applications including GNSS-denied environments.

A GNSSDO module acts as a PNT subsystem within a larger system design or as a stand-alone system, providing precise timing that is critical to any high-performance system. The local oscillators used in the GNSSDO modules are engineered and manufactured by Microchip, ensuring customers have a product that they can trust. Other Microchip components on the module include 32-bit microcontrollers (MCUs) and SmartFusion® 2 FPGAs.

Microchip's newly released GNSSDO modules include:

- The **MD-013 ULTRA CLEAN** is Microchip's highest performance standard GNSSDO module that can support multiple GNSS constellations, including GPS, Galileo, BeiDou, and NavIC or an external reference input. This module is designed around a high-performance OCXO that enables outputs with ultra-low phase noise and short-term frequency stability characteristics. The respective specifications for phase noise performance are −119 dBc/Hz at a 1 Hz offset and noise floor of −165 dBc/Hz. Short-term frequency stability, measured by Allan Deviation (ADEV), is 3E-13 at 1s tau, 6E-13 at 10s tau and 9E-13 at 100s tau. This module can generate 1 PPS TTL, 10 MHz sine wave and 10 MHz square wave outputs that are disciplined to an embedded 72-

channel single-band GNSS receiver, with the option to upgrade to a configurable L1/L2 or L1/L5 dual-band, multi-GNSS receiver.

- The **MD-300** is Microchip's GNSSDO module for harsh environments, available in a small 1.5 × 2.5 inch footprint. The MD-300 has an embedded MEMS OCXO or TCXO as the local oscillator, enabling low g-sensitivity, high shock and vibration tolerance and low thermal transient response. Due to its Size, Weight and Power (SWaP) performance, the MD-300 is well-suited for applications like drones and manpacks. The module can discipline to an embedded GNSS receiver or external reference and output high- performance 10 MHz and 1 PPS signals.
- The **LM-010 is a PPS disciplined module** that provides precise timing for Low Earth Orbit (LEO) applications that demand radiation tolerance coupled with stability and holdover capability. As a standard platform module, the LM-010 provides both 1 PPS TTL and 10 MHz sinewave outputs that are disciplined to an external reference input. Internal to the module is Microchip's digitally corrected OCXO or low-power CSAC SA.45.

"Microchip's expertise in PNT systems is instrumental in helping our customers seamlessly integrate these GNSSDO modules into their designs," said Randy Brudzinski, corporate vice president of Microchip's frequency and time systems business unit. "Our products can be adjusted to meet the specific requirements of each application, whether it is through a custom solution or incremental changes to the standard product. We provide an end-to-end solution to streamline the development process."

Microchip's GNSSDO modules utilize a common serial communication protocol and Graphical User Interface (GUI) for command and control of the unit. A variety of parameters can be configured through the software including inputs, outputs, auto switching, holdover parameters, GNSS tracking and observables, as well as reporting messages coming off the serial interface.

Microchip offers a broad portfolio of high-reliability solutions designed for aerospace and defense including Radiation-Tolerant (RT) and Radiation-Hardened (RH) MCUs, FPGAs and Ethernet PHYs, power devices, RF products, timing solutions, as well as discrete components from bare die to system modules. Additionally, Microchip offers a wide range of components on the QPL to better serve its customers. To learn more about Microchip's aerospace and defense solutions, visit the **web page**.

Development Tools

The GNSSDO portfolio is supported by Microchip's **VDOM3 software** and GUI to help developers adjust performance parameters of the GNSSDO modules and quickly test integrating these products into their systems. The **MD-01X Evaluation Kit** is also available to easily connect and monitor the MD-01 series of GNSSDOs.

Pricing and Availability

The GNSSDO modules are available for purchase in production quantities. For additional information and to purchase, contact a **Microchip sales representative** or an authorized distributor.

Resources

High-res images available through Flickr or editorial contact (feel free to publish):

- Application image: **www.flickr.com/photos/microchiptechnology/54505488012/sizes/l**

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