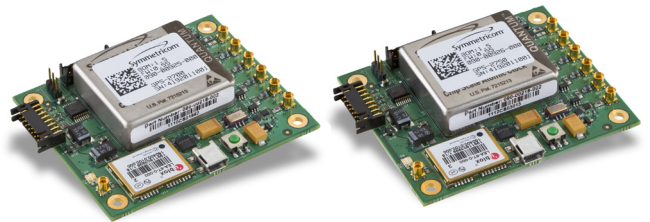


# GPS-2700 and GPS-2750

10 MHz CSAC-based GPS Disciplined  
Oscillator, Featuring the QUANTUM™  
SA.45s Chip Scale Atomic Clock (CSAC)



## Key Features

- High-performance GPS receiver
- Unparalleled holdover: typically  $\pm 1\mu\text{s}$  over 24 hrs. at 25°C
- Ultra low power consumption:  $\leq 1.4\text{W}$  at 25°C (12V Vdd)
- Fast warm-up time: <110 seconds at 25°C
- Industry leading 1PPS accuracy:  $\pm 15\text{ns}$  to UTC RMS (1-sigma), GPS locked
- Small footprint and low profile: only 2.5" x 3" x 0.7"

## Applications

- Unmanned Aerial Vehicles (UAV's)
- IED Jammers — fixed, mounted, dismounted
- Radar systems
- Aircraft guidance systems
- Tactical radios
- Underwater systems using GPS for initialization

The Symmetricom® GPS-2700 and GPS-2750 are the preeminent solutions for demanding mobile GPS applications. These include military man-pack radios that require very low-g static sensitivity, MILSATCOM terminals, avionics payloads for Unmanned Autonomous Systems (UAS) and high acceleration applications such as jet fighters. All of these applications are increasingly expected to deliver mission critical performance even in GPS-denied environments. Other applications include network timing in stationary applications such as base-stations.

## Product Description

The GPS-2700 and GPS-2750 are 10 MHz CSAC-based GPS Disciplined Oscillators (GPSDO's). The GPS-2700 covers a temperature range of 0°C to +75°C, while the GPS-2750 covers an extended range of -40°C to +85°C. Both products utilize Symmetricom's QUANTUM™ series SA.45s Chip Scale Atomic Clock, as their frequency reference, which enables unparalleled

holdover capability, an ultra low-g static sensitivity, and a very fast warm up time of <110 s. The built-in high-performance GPS receiver is able to operate in a base station position-hold mode using an auto survey feature, which allows operation with just a single satellite in view, and hence improves timing stability. The unit can also be set to operate in highly-dynamic mobile environments with only a minimum loss in timing stability versus the position-hold mode.

Standard outputs, via a low-noise distribution amplifier, include four 10 MHz sine wave outputs, one 5 MHz CMOS output, and one 1 PPS output. Other standard features include; a 16x2 character LCD driver (display not included), and a phase noise filter. The units can be powered from standard aircraft or vehicle power with an 8V to 36V operating range, with built-in reverse polarity protection. Alternatively the unit can be powered through a 5 volt mini-USB power supply.

# GPS-2700 and GPS-2750 10 MHz CSAC-based GPS Disciplined Oscillator

## Specifications

### ELECTRICAL SPECIFICATIONS

#### MODULE

|                                          |                                                                                                                          |
|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Long-Term Oscillator Aging (without GPS) | Less than 0.3ppb per month in holdover without GPS                                                                       |
| Frequency Stability Over Temperature     | Better than $\pm 0.5\text{E-}09$ (CSAC only, no GPS disciplining, 0°C to +75°C)                                          |
| 1 PPS Accuracy                           | $\pm 15\text{ns}$ to UTC RMS (1-Sigma) GPS Locked in Position Hold mode                                                  |
| Frequency Accuracy                       | Better than $\pm 2\text{E-}10$ after 3 minutes operation with GPS lock                                                   |
| Holdover Stability (typical)             | $< \pm 2\mu\text{s}$ over 24 hour period at +25°C (after 1 hour with GPS lock)                                           |
| ADEV (with GPS lock)                     | 1s: $< 1\text{E-}10$ , 10s: $< 2.5\text{E-}11$ , 100s: $< 2\text{E-}11$ , 1Ks: $< 1\text{E-}11$ , 10Ks: $< 2\text{E-}12$ |
| 1 PPS Output (CSAC Flywheel Generated)   | 5V CMOS output, can be shifted in 1ns steps relative to UTC                                                              |
| 10MHz Output, 5MHz Output                | Four isolated 10MHz sine wave +13dBm $\pm 3\text{dB}$ , one 5MHz CMOS 5V                                                 |
| Distribution Amplifier Port Isolation    | 2MHz: $> 98\text{dB}$ , 10MHz: $> 85\text{dB}$                                                                           |
| RS-232 Control (Including USB Port)      | Full SCPI-99 control commands at 9.6K, 19.2K, 38.4K, 57.6K, 115.2K                                                       |
| RS-232 NMEA Output Sentences             | NMEA 0183 rev. 2.3, Sentences: GGA, RMC, ZDA, PASHR, and others                                                          |
| GPS Frequency, Antenna                   | L1 C/A 1574MHz, passive or active antenna 5V, MMCX connector                                                             |
| GPS Receiver                             | 50 channels, mobile SBAS: WAAS, EGNOS, MSAS supported                                                                    |

|                                              |                                                                                      |
|----------------------------------------------|--------------------------------------------------------------------------------------|
| Sensitivity                                  | Acquisition - 144 dBm,<br>Tracking - 160 dBm                                         |
| GPS TTFF                                     | Cold start - <45 sec<br>Warm start - 1 sec<br>Hot start - 1 sec                      |
| GPS Receiver Motion Adaptive Filter Settings | Optimized depending on vehicle velocity (Auto-sensing, auto-switching)               |
| TTL Alarm Output                             | GPS unlock and event indicator                                                       |
| Warm Up Time / Stabilization Time            | <2 min at +25°C to <5E-10 accuracy typ. (no GPS)                                     |
| Supply Voltage (Vdd)                         | Aircraft and vehicle power range: 8V to 36VDC, or 5V via mini-USB                    |
| Power Consumption                            | <1.4W at +25°C; <1W with CMOS output option at 12V Vdd                               |
| Operating Temperature                        | 0°C to +75°C (GPS-2700) or -40°C to +85°C (GPS-2750)                                 |
| g-sensitivity                                | <0.2ppb per-g per-axis                                                               |
| Magnetic Sensitivity                         | <9.0E-11/Gauss, $\pm 2.0$ Gauss                                                      |
| Storage Temperature                          | -45°C to +90°C                                                                       |
| MTBF                                         | >100,000 hours (0°C to +75°C)                                                        |
| USB, LCD support                             | Optionally USB powered and controlled, supports 16x2 LCD displays                    |
| Ordering Options                             | Remove phase-noise-filter option, CMOS 10MHz output option, 5.0V power supply option |

|                    |                                                                                                |
|--------------------|------------------------------------------------------------------------------------------------|
| <b>PHASE NOISE</b> | 10Hz -90dBc/Hz<br>100Hz -125dBc/Hz<br>1KHz -145dBc/Hz<br>10kHz -152dBc/Hz<br>100kHz -153dBc/Hz |
|--------------------|------------------------------------------------------------------------------------------------|