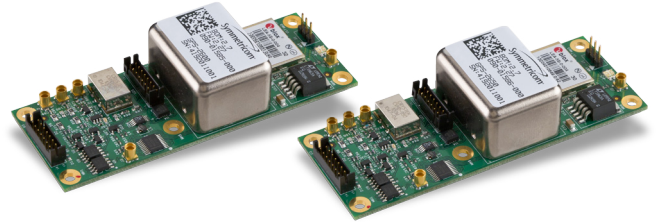


# GPS-2600 and GPS-2650

## 100 MHz DOCXO-based GPS Disciplined Oscillator



### Key Features

- High-performance GPS Receiver
- Small footprint and low profile: only 1.5" x 4" x 0.8"
- Excellent holdover stability
- Built-in Distribution Amplifier for multiple outputs at both 100 MHz and 10 MHz
- Low phase noise and very low phase noise floor at 100 MHz
- 1 PPS output accuracy of  $\pm 30$  ns to UTC RMS (1-sigma), GPS-locked

### Applications

- Unmanned Aerial Vehicles (UAV's)
- IED Jammers – fixed, mounted, dismounted
- Radar Systems
- Satellite Communications terminals
- Aircraft Guidance Systems
- Tactical Radios
- Underwater systems using GPS for initialization

The Symmetricom® GPS-2600 and GPS-2650 are 100 MHz Double-Oven OCXO-based GPS Disciplined Oscillators (GPSDO's). The GPS-2600 covers a temperature range of  $-25^{\circ}\text{C}$  to  $+75^{\circ}\text{C}$ , while the GPS-2650 covers an extended range of  $-25^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ . Both units feature a high-performance GPS receiver that can track up to 50 GPS signals, down to levels as low as  $-160$  dBm. The receiver is compatible with GPS, WAAS, EGNOS, and MSAS signals, and is Galileo-ready.

Special software functionality supports airborne applications by providing avionics systems with a 3D velocity vector, Attitude/Tilt information, Speed, Heading, Height (both MSL and GPS height), Position, Time, Date, Frequency, Time-stamping, and Health information. For mission-critical applications, the units also provide a direct redundancy feature, allowing multiple units to be daisy-chained to each other for increased reliability.

By providing both 10 MHz and 100 MHz reference outputs in one compact unit, the GPS-2600 and GPS-2650 are an excellent fit for up-conversion subsystems used in radar and satellite equipment, where very low phase noise is critical. The units provide two 10 MHz outputs, one sine wave at  $+13$  dBm, and one with LVDS-compatible levels. They also provide seven

100 MHz outputs, 2 sine wave at  $+7$  dBm each, 4 LVDS-compatible, and 1 5V CMOS-compatible. There are also three 1 PPS outputs, one each with 5V CMOS, LVDS, and RS-232 compatible levels. The 1 PPS output is accurate to within  $\pm 30$  ns of UTC RMS (1-sigma), once GPS lock has been achieved.

Holdover stability is excellent, at better than  $\pm 7$   $\mu\text{s}$  over a 24-hour period at  $+25^{\circ}\text{C}$ . Phase noise at 10 MHz is  $< -100$  dBc/Hz at a 1 Hz offset, with the comparable number for the 100 MHz output being  $-60$  dBc/Hz. The noise floor of the 10 MHz output is  $< -145$  dBc/Hz, and for the 100 MHz output it is an extremely low  $-160$  dBc/Hz. The units consume  $< 4\text{W}$  of power at  $+25^{\circ}\text{C}$ .

These units can be monitored and controlled through an RS-232 port via standard SCPI commands, and they also can generate NMEA-0183 output sentences for easy integration into existing system architectures.

# GPS-2600 and GPS-2650 100 MHz DOCXO-based GPS Disciplined Oscillator

## Specifications

### ELECTRICAL SPECIFICATIONS

#### MODULE SPECIFICATION:

1 PPS Accuracy	±30ns to UTC RMS (1-sigma) GPS locked
Frequency Accuracy	Better than ±3.0 E-10 after 1 hour operation with GPS locked
Holdover Stability	±7µs over 24 hour period @+25°C (no motion)
ADEV	1s to 1000s: 2.0E-11 with GPS lock (typical)
1 PPS Outputs (OCXO Flywheel Generated)	Three outputs: 5V CMOS, LVDS, and RS-232 level output
10/100MHz Outputs (9 outputs total, 7 @ 100MHz, 2 at 10MHz)	4x LVDS 100MHz, 2x sine 100MHz at +7dBm, 1x CMOS, 1x sine 10MHz at +12dBm, 1x LVDS 10MHz
RS-232 Control	Full control via SCPI-99 control commands, NMEA-0183
Avionics Support	3D velocity vector (velocity output for the X, Y, and Z planes)
GPS Frequency	L1, C/A 1574MHz
GPS Antenna	Passive or active, 5V
GPS Receiver	50 channels, mobile, GPS, WAAS, EGNOS, MSAS supported, Galileo ready
Sensitivity	Acquisition -144 dBm Tracking -160 dBm
GPS TTFF	Cold start - <45 sec Warm start - 1 sec Hot start - 1 sec

TTL Alarm Output	GPS unlock and hardware failure indicator
Warm Up Time/ Stabilization Time	<10 min to 1.0E-9 accuracy at +25°C (typical)
Supply Voltage (Vdd)	11.0V to 16.0V DC nominal
Power Consumption	< 4W at +25°C
Operating Temperature	-25C to +75C (+85C extended temp range option)
Environmental Conformance	MIL-STD-202, method 204, condition I-A
Storage Temperature	-45°C to +85°C

#### OSCILLATOR SPECIFICATION:

Frequency Output	10MHz and 100MHz
10/100MHz Retrace	±2E-08 after 1 hour
Frequency Stability Over Temperature	±2.5E-10 low-g option: ±3E-10 per g per axis
Oscillator Heater Warm-Up Time	<12 min
<b>Phase Noise</b>	<b>100MHz</b> <b>Out10MHz Out</b>
1Hz	-60dBc/Hz      -100dBc/Hz
10Hz	-95dBc/Hz      -125dBc/Hz
100Hz	-118dBc/Hz      -140dBc/Hz
1kHz	-140dBc/Hz      -142dBc/Hz
10kHz	-155dBc/Hz      -145dBc/Hz
100Khz	-160dBz/Hz      -145dBc/Hz
Designed Lifetime	>10 years