

GPS-2500 and GPS-2550

10 MHz DOCXO-based GPS Disciplined Oscillator



Key Features

- High-performance GPS Receiver
- Small footprint and low profile: only 1.5" x 3" x 0.8"
- Excellent holdover stability
- Built-in 10 MHz Distribution Amplifier with 3 outputs (>80 dB isolation)
- Low phase noise
- 1 PPS output accuracy of ± 50 ns to UTC RMS (1-sigma), GPS-locked
- Low temperature coefficient of $\pm 2.5E-10$

Applications

- Unmanned Aerial Vehicles (UAV's)
- IED Jammers – fixed, mounted, dismounted
- Radar Systems
- Aircraft Guidance Systems
- Tactical Radios
- Underwater systems using GPS for initialization
- DAB/DVB-T

The Symmetricom® GPS-2500 and GPS-2550 are 10 MHz Double-Oven OCXO-based GPS Disciplined Oscillators (GPSDO's). The GPS-2500 covers a temperature range of 0°C to +75°C, while the GPS-2550 covers an extended range of -25°C to +75°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.

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.

The GPS-2500 and GPS-2550 provide three high-isolation 10 MHz sine-wave outputs (>90 dB at 10 MHz, >80 dB at 3 GHz), each at +13 dBm, as well as one differential LVDS 10 MHz output. They also provide a single 1 PPS LVDS differential output with ± 50 ns accuracy to UTC RMS (1-sigma), once GPS lock has been achieved.

Holdover stability is excellent, just ± 7 μ s over a 24-hour period at +25°C. Phase noise is <-90 dBc/Hz at a 1 Hz offset, and the units consume <4W of power at +25°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.

The GPS-2500 and GPS-2550 offer all of this performance in a package that is less than one-half the size of the smallest competitive products.

GPS-2500 and GPS-2550 10 MHz DOCXO-based GPS Disciplined Oscillator

Specifications

ELECTRICAL SPECIFICATIONS

MODULE SPECIFICATION:

1 PPS Accuracy	±30 ns to UTC RMS (1-Sigma) GPS locked
Frequency Accuracy	Better than ±3.0E-10 after 1 hour operation with GPS locked
Holdover Stability	±7µs over 24 hour period (@+25°C [no motion, after 3 days with GPS])
ADEV	0.1s to 1000s: <1.0E-11 with GPS lock
1 PPS Output (OCXO Flywheel Generated)	LVDS differential output, RS-232 level output
10MHz Output	One LVDS differential pair (+/-300 mv) and three sine wave with > 80 dB isolation at +13dBm ±3dB
Distribution Amplifier Port Isolation	2MHz: > 98dB, 10MHz: > 92dB, 1GHz: > 92dB
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), 3D MEMS accelerometer with ±3G range
GPS Frequency	L1, C/A 1574MHz
GPS Antenna	Passive or active, 5V
GPS Receiver	50 Channels, Mobile, GPS, WAAS, EGNOS, MSAS supported
Sensitivity	Acquisition - 144 dBm Tracking - 160 dBm
TTFF	Cold start - <45 sec, Warm start - 1 sec Hot start - 1 sec

TTL Alarm Output	GPS unlock and event indicator
Warm Up Time / Stabilization Time	<10 min to 1.0E -9 accuracy at +25°C (typical)
Supply Voltage (Vdd)	12 VDC nominal ±5%
Power Consumption	<4W at +25°C
Operating Temperature	0°C to +75°C [-25C to +75C extended temp range available]
Storage Temperature	-45°C to +85°C

OSCILLATOR SPECIFICATION:

Frequency Output	10MHz
10MHz Retrace	±2E-08 after 24 hrs. on, 24 hrs. off, 1 hr. on @ +25°C (no GPS)
Frequency Stability Over Temperature	±2.5E-10
Oscillator Heater Warm Up Time	<8 min

Phase Noise

1Hz	-90dBc/Hz
10Hz	-120dBc/Hz
100Hz	-140dBc/Hz
1kHz	-150dBc/Hz
10kHz	-155dBc/Hz
Designed Lifetime	>10 years