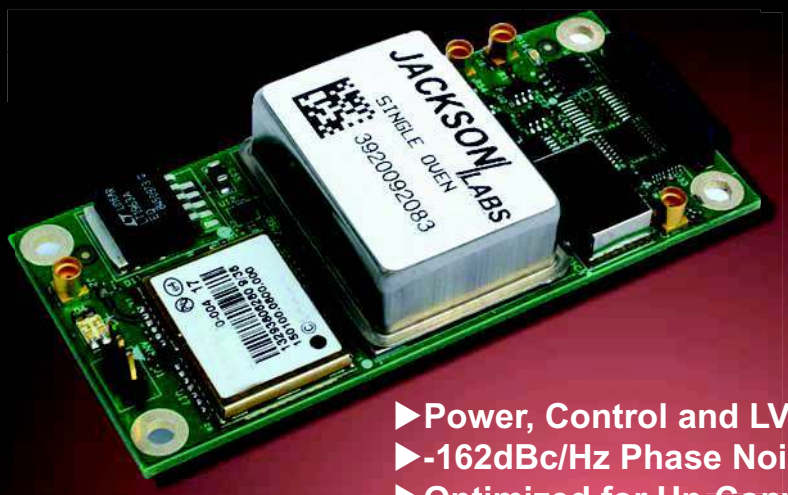
JACKSON LABS

The Next Generation of Timing & Frequency

ULN-2550 One of the smallest GPSDOS



▶Power, Control and LVDS on one Connector
▶-162dBc/Hz Phase Noise Floor
▶Optimized for Up-Conversion to Ka/Ku/K Bands
▶NMEA-0183 SCPI-99 Plug and Play

The ULN-2550 time-, frequency-, and position-reference is an extremely small Global Positioning System Disciplined Oscillator (GPSDO) optimized for up-conversion applications that require 100MHz, 25MHz, 10MHz, and/or 50MHz sources. The 10MHz and 100MHz outputs are always available, while the 25MHz output can be changed into a 50MHz output via stuffing options. The ULN-2550 has the following main features: a high-end SC-cut Double Oven Crystal Oscillator, four 25/50MHz LVDS outputs, one 100MHz CMOS output, as well as a10MHz CMOS output, a 1PPS LVDS output, and a high-performance 50-channel GPS receiver with -160dBm tracking capability. With the exception of the GPS antenna connection, the ULN-2550 provides all of it's IO and power-input on one single connector that can either have a board-to-board interface, or a cable harness, making system integration straight forward, and compatible to stringent military requirements.

All outputs are frequency and phase-synchronized to UTC via the GPS system, and thus provide Better-Than-Cesium™ long-term performance. By providing 25/50MHz as well as 100MHz and 10MHz references in one compact board, the unit is a good fit for Ultra Low-Phase-Noise up-conversion systems as used in Radar and Satellite communication equipment.

At only 1.5 x 3.25 Inches small, the ULN-2550 provides Stratum-1 long-term performance of better than 5 parts per Trillion (5E-012) averaged over 24 hours with various options for temperature range, thermal stability, as well as g-sensitivity, and shock/vibration insensitivity.

The ULN-2550 provides an OCXO-sourced 1PPS LVDS output that is phase-synchronized to better than 30ns rms to UTC (typ. <10ns rms). The unit can be monitored and controlled by an RS-232 port via standard SCPI Commands, and is capable of generating various NMEA-0183 output sentences for easy integration into existing infrastructure. With a phase noise floor of better than -160 dBc/Hz at 100MHz, superior spurious-suppression, and very low jitter (<400fs rms) at a power consumption of <4W, the ULN-2550 sets a new performance standard.

The ULN-2550 is also available with a Ruggedized, extended temp-range, and low-g Oscillator option for demanding applications. For mission-critical applications the ULN-2550 provides a direct redundancy feature allowing multiple units to be daisy-chained to each other for increased reliability.

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Electrical Specifications:

Module Specification:

1 PPS Accuracy	±30ns to UTC RMS (1-Sigma) GPS Locked
Frequency Accuracy	Better than ±3E-010 after 1 hours operation with GPS locked
Holdover Stability	<±7us over 24 Hour Period @+25°C (No Motion)
ADEV	1s to 1000s: <5E-11 with GPS lock typical
1 PPS Outputs (OCXO Flywheel Generated)	LVDS
10/25/100MHz Outputs (6x total, 4x @25/50MHz, 10MHz, 100MHz)	4x LVDS 25/50MHz, 1x CMOS 100MHz, 1x CMOS 10MHz
RS-232 Control	Full control via SCPI-99 Control Commands, NMEA-0183
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 at +25°C to 1E-09 Accuracy Typ.
Supply Voltage (Vdd)	11.0V to 16.0V DC Nominal
Power Consumption	< 4W at +25°C with DOCXO
Operating Temperature	Extended temp range: -25C to +75C
Environmental Conformance	MIL-STD-202, Method 204, Condition I-A
Storage Temperature	-45°C to +85°C

Oscillator Specification:

Frequency Output	10MHz, 25/50MHz, and 100MHz outputs
10/100MHz Retrace without GPS	±2E-08 After 1 Hour
Frequency Stability	±2.5E-010 over temperature, low-g option: ±3E-010 per g per axis
Output Amplitude	100MHz: CMOS 3.3V, 10MHz: CMOS 5V, 25/50MHz: LVDS
Warm Up Time	< 12 min

Phase Noise

	25MHz Out	10MHz Out
1Hz	-88dBc/Hz	-100dBc/Hz
10Hz	-109dBc/Hz	-125dBc/Hz
100Hz	-125dBc/Hz	-142dBc/Hz
1kHz	-145dBc/Hz	-152dBc/Hz
10kHz	-155dBc/Hz	-155dBc/Hz
100kHz	-160dBz/Hz	-155dBc/Hz

Also Available:

100 MHZ& 10 MHZ, SINGLE OVEN,
Double Oven Stardard Temp.
Double Oven Extended Temp. -40 + 75C

DESIGNED LIFETIME > 10 YEARS

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