

Typical Application

- Avionics waveform generation
- SDR instrumentation
- Medical/industrial RF drivers
- Lab prototyping

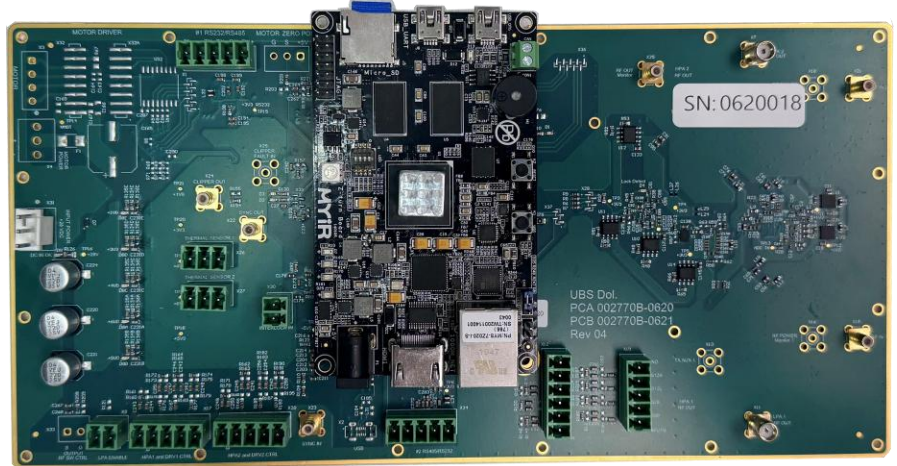
Product Features

- Wideband RF Coverage: 800 MHz to 1800MHz.
- Independent TX/RX with 12-bit ADC/DAC converters up to 61.44 MSPS.
- Configurable Bandwidth: 200 kHz to 56 MHz per channel.
- High-Stability Reference: 80 MHz low-jitter XO, ± 10 ppm typical.
- Fractional-N PLL with optional divider and low-pass post-filter.
- Clock buffer with <50 fs additive jitter and <25 ps skew.
- Single +28 V DC input with on-board DC/DC and low-noise LDO regulation.
- Programmable Gain Control with 90 dB dynamic range 0.25 dB steps.
- TX monitor and RF power monitor ports
- Control Interfaces: SPI, I²C, RS-232, RS-485; external sync input/output.
- Fan control, PSU monitoring, HPA/driver interlock and fault reporting.
- Compact Integration: Designed for direct coupling to FPGA/SoC carrier

Product Description

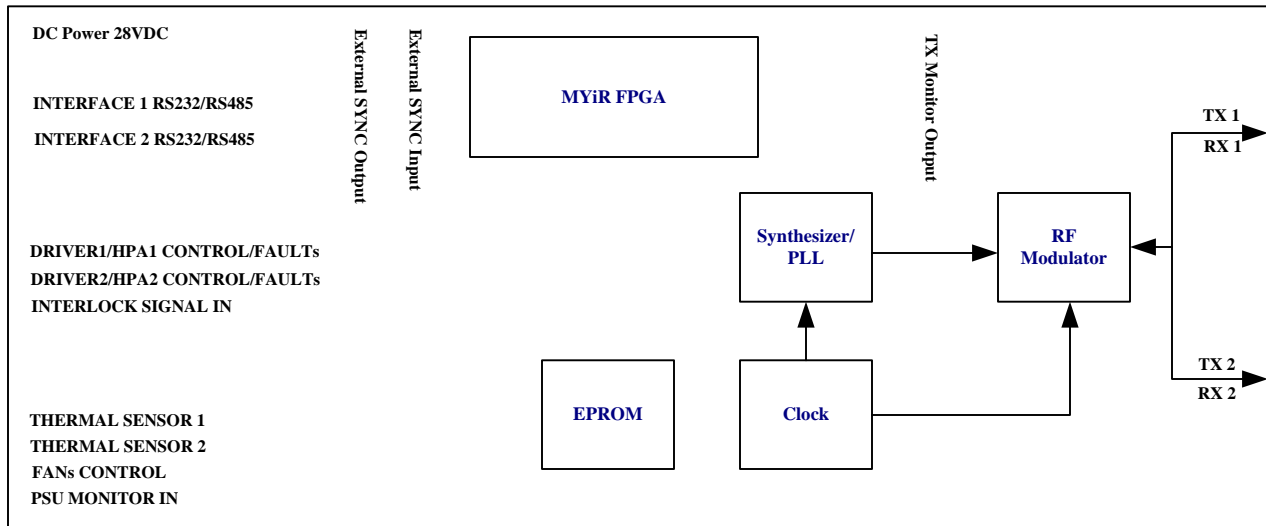
The Programmable Waveform Generator (PWG) board is a compact RF transceiver and modulation platform designed for generating and capturing complex waveforms across L- and S-band frequencies. It integrates a broadband RF transceiver IC (AD9361), a high-performance fractional-N PLL synthesizer (ADF4356) with optional divide-by-2 stage, and a low-jitter reference/clock distribution system.

The board operates from a single 12-36 V DC input, internally generating regulated rails for sensitive analog, RF, and digital domains. With programmable filtering, attenuators, and extensive synchronization/control options, the PWG can serve as the core of avionics, test/instrumentation, or research platforms requiring flexible RF waveform synthesis and capture.



Programmable Waveform Generator

Block Diagram



Specification

RF Performance (TX / RX Paths)

Parameter	Typ
Operating band RX/TX path	0.80 – 1.80 GHz
TX output level	+8 dBm
TX flatness across band	±1.5 dB
Harmonics at 0 dBm out	–45 dBc
Spurious (non-harmonic)	–60 dBc
TX monitor coupling (TX_MON)	–20 dB
RX noise figure	2.5 dB
RF I/O return loss	13 dB

Local Oscillator & Clocking

Parameter	Typ
Reference oscillator frequency	80.000 MHz
XO frequency stability	±10 ppm
XO RMS jitter (12 kHz–20 MHz)	0.5 ps
PLL output frequency	0.035 - 6.8 GHz
PLL output power	0 to +5 dBm
Phase noise @ 100 kHz offset	–115 dBc/Hz
Integrated RMS jitter	0.3 ps

Baseband & Digital

Parameter	Typ
Channel bandwidth	0.2 - 56 MHz
Converters	12-bit ADC/DAC
Sample rate	61.44 MSPS
TX EVM	3%
Gain control range	89.75 dB
Gain control step	0.25 dB

Power

Parameter	Typ
Primary input voltage	12 - 36 V
Local rails available	1.8 / 3.3 / 4.0 / 5.0 / 6.0 V
Total board power	6–12 W

Sync & Control I/O

Parameter	Typ
Interface	Levels
EXT SYNC IN / OUT	Positive 30V, Negative -30V, Bipolar +30V
RS-232 / RS-485	Standard
SPI / I ² C	3.3 V