44 GHz Low Phase Noise Synthesizer Supports Phase-Coherent Channels

AnaPico Switzerland has improved the performance of its 22 GHz frequency synthesizer, launched earlier this year, extending the frequency range to 44 GHz and significantly reducing the single sideband (SSB) phase noise. Most of the other functions of the new APMSYN40 wideband synthesizer remain the same as in the earlier model.

The frequency range of the APMSYN40 is 10 MHz to 44 GHz, and it has a switching time of about 10 µs and an output power range from 0 to 23 dBm. The SSB phase noise at a 20 kHz offset from a 1 GHz carrier is -145 dBc/Hz, with a 10 GHz carrier, it's -120 dBc/Hz. Resolution is 1 mHz for frequency and 0.5 dB for power. The frequency accuracy is calibrated to ±30 ppb and temperature stability is ±100 ppb over the operating temperature range from 0°C to 50°C.

The synthesizer is available in a well shielded, passively cooled, compact flange-mountable module of 150 x 60 x 30 mm^3, weighing under 0.5 kg and consuming less than 20 W power. It has an Ethernet communication port for connecting to a PC and is controlled with either a graphical software interface or SCPI commands.

The APMSYN40 supports external references of 100 MHz and 1 GHz. Multiple units can be connected for multi-channel, phase-coherent sources, generating the main 1 GHz reference frequency in one unit and looping it to the others. Phase-coherence is approximately ±0.5 degrees over 10 hours with all channels at 5 GHz.

This wideband, fast switching synthesizer is well-suited for applications requiring a controlled phase difference between multiple channels—radar, electronic warfare, beamforming, quantum computing—or a single unit can be used as a system clock.

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