

# Integrated multi-band RF synthesizers



## The STW8110 cost-optimized integer-N series reduces RF BOM and footprint with top performances

ST's widely deployed STW8110 series of RF synthesizers are single-chip cost-optimized alternatives to discrete PLL and VCO solutions or other more expensive solutions.

Each of the three devices in the STW8110 series include an integer-N frequency synthesizer and two fully integrated VCOs which feature low phase noise and a noise floor of -155 dBc/Hz. The combination of wide frequency range VCOs and multiple output options (direct output, divided by two, or divided by four) allows the synthesizers to show multi-band features and frequency coverage up to 5 GHz.

### KEY FEATURES

- Integer-N frequency synthesizer
- Dual differential integrated VCOs with automatic center frequency calibration
- Embedded dividers by 2 and by 4
- Fast lock time: 150  $\mu$ s
- Dual modulus prescaler
- Two programmable counters
- Programmable reference frequency divider
- Frequency comparator and charge pump
- Programmable charge pump current
- Digital lock detector
- Dual digital bus interface: SPI and I<sup>2</sup>C bus
- Package: VFQFPN28 exposed pad 5 x 5 x 1.0 mm

### KEY BENEFITS

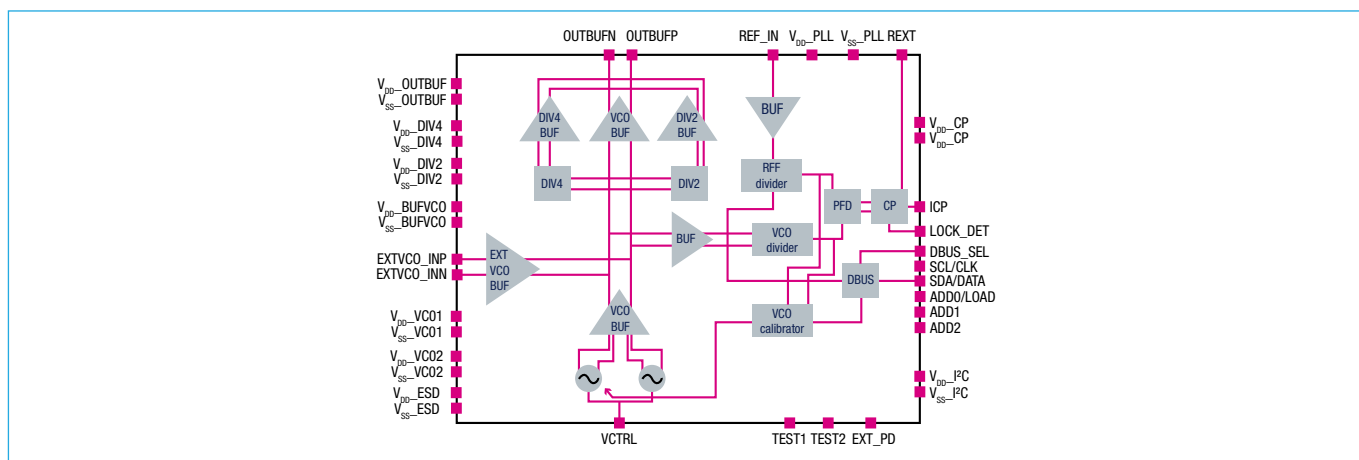
- High level of integration: single-chip PLL and VCOs leads to reduced BOM and footprint plus increased reliability
- Wideband coverage: single-chip synthesizers operating up to 5 GHz
- Multi-band support: multiple output options enable each synthesizer to address 1 GHz, 2 GHz and 4 GHz bands
- Excellent PLL phase noise: best-in-class integrated phase noise performance

### TARGETED APPLICATIONS

- Cellular 3G/4G infrastructure equipment
- Other wireless infrastructure equipment
- Satellite, cable modems and other communication systems
- Test and instrumentation equipment



## STW8110 BLOCK DIAGRAM



## EVALUATION KITS

Evaluation kits for the STW8110 series include:

- Evaluation board
- GUI (graphical user interface) software to program the device
- Measured S parameters of the RF output
- ADS2005 schematics providing guidelines for application board design
- STWPLLSim software to simulate PLL performance and loop filter design
- PC connection cable

Three evaluation board options are available for each STW8110 device, tuned for sub bands around 1GHz, 2GHz and 4GHz. See table below for order codes.

## STW8110 SERIES

Part number	Output frequency range	Closed loop phase noise (dBo/Hz) - typical values			
		1 GHz (with divider by 4, 100 kHz step)	2 GHz (with divider by 2, 200 kHz step)	4 GHz (direct output, 400 kHz step)	Evaluation kit order codes
<b>STW81101</b>	825 to 1100 MHz 1650 to 2200 MHz 3300 to 4400 MHz				STW81101-EVB1G/2G/4G
<b>STW81102</b>	750 to 905 MHz 1000 to 1162 MHz 1500 to 1810 MHz 2000 to 2325 MHz 3000 to 3620 MHz 4000 to 4650 MHz	-67 @ 1 kHz -95 @ 10 kHz -114 @ 100 kHz -140 @ 1 MHz -154 @ 10 MHz -155 @ 40 MHz	-61 @ 1 kHz -89 to 10 kHz -112 @ 100 kHz -134 @ 1 MHz -152 @ 10 MHz -155 @ 40 MHz	-55 @ 1 kHz -83 @ 10 kHz -106 @ 100 kHz -128 @ 1 MHz -149 @ 10 MHz -158 @ 40 MHz	STW81102-EVB1G/2G/4G
<b>STW81103</b>	625 to 762.5 MHz 1087.5 to 1525 MHz 2175 to 3050 MHz 4350 to 5000 MHz				STW81103-EVB1G/2G/4G

## FOR FURTHER INTEGRATION

The STW8210 series of RF down-converters combines the STW8110's synthesizer core with a high-linearity RF mixer and an IF amplifier.



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