PRODUCT SUMMARY

SKY74218: RF Transceiver with DigRF Interface for Quad-Band GSM, GPRS, and EDGE Applications

Applications
- GSM850, EGSM900, DCS1800, and PCS1900 handsets
- GPRS handsets and modules
- EDGE handsets and modules

Features
- General:
  - 0.13 µm RF CMOS technology
  - Low external component count
  - Supports multi-slot GPRS and EDGE applications up to Class 34/39
  - GMSK and 8-PSK digital modulator
  - Low power operation
  - Three additional auxiliary system clocks
  - Dual-row RFLGA™ (44-pin, 5 x 5 mm) Pb-free (MSL3, 250 °C per JEDEC J-STD-020) package
- Baseband:
  - Compatible with DigRF v1.12 interface
  - Supports buffering of five transmit slots in DigRF block mode
  - Simplified control interface with channel and PCL programming
- Synthesizer:
  - Single integrated, fully programmable fractional-N synthesizer suitable for multi-slot EGPRS operation
  - Fully integrated wideband UHF VCO
  - Digital crystal oscillator center frequency control
  - Digital PLL
- Transmit:
  - Closed Polar Loop™ transmitter
  - No delay adjustment required
  - Integrated quad-band transmit VCO
  - Transmit power ramping and power control level, including generation of ramp signal from the PCL DAC value
  - PA saturation detection and prevention circuit
- Receive:
  - Programmable low IF architecture
  - Four separate LNAs with differential inputs
  - Gain selectable in 2 dB or 6 dB steps
  - Programmable FIR filter coefficients
  - Digital receive filter chain

Description

The SKY74218 Digital RF (DigRF) Transceiver is a highly integrated device designed for Skyworks Helios™ 3D EDGE RF Subsystem. This subsystem is intended for quad-band Global System for Mobile Communications (GSM), General Packet Radio Service (GPRS), and Enhanced Data Rate for GSM Evolution (EDGE) handsets and modules. The Helios 3D EDGE RF Subsystem supports GSM850, EGSM900, DCS1800, and PCS1900 applications.

The receiver consists of four integrated Low Noise Amplifiers (LNAs), a quadrature demodulator, and selectable baseband filter bandwidths.

The low Intermediate Frequency (IF) receive architecture incorporates digital back-end filtering. Analog signals are converted into a digital representation suitable for Digital Signal Processor (DSP) operations. The timing and control section of the SKY74218 generates a 26 MHz high-stability clock for use on-chip and a 26 MHz signal (SYSCLK) supplied to the baseband.

Three additional reference clocks are also available.

The device also generates a number of internal General Purpose Inputs/Outputs (GPIOs) used for timing and control, and an analog signal to control the PA output power.

The SKY74218 implements Skyworks closed Polar Loop transmit architecture. This architecture, while maintaining the traditional analog In-Phase and Quadrature (I/Q) signals, autonomously splits the amplitude and phase within the device. The filter-saving advantage of the translation-loop approach is embedded in the architecture. Also included is an AM loop that provides both signal AM and power level control.

The SKY74218 features an integrated, fully programmable, ΣΔ fractional-N synthesizer suitable for EGPRS multi-slot operation. The reference frequency for the synthesizer is supplied by an integrated Capacitance Controlled Crystal Oscillator (CCXO) circuit that enables the use of a low-cost crystal. The CCXO also provides a buffered reference frequency output to supply other devices in the system.
The SKY74218 is intended to be used with Skyworks SKY77524 Front-End Module (FEM) (Data Sheet #200638), which contains a switch, PA, and an integrated coupler for use with Skyworks closed Polar Loop EDGE architecture. Together, the transceiver and FEM form the Helios 3D EDGE RF Subsystem.

The SKY74218 is packaged in a small, 44-pin 5 x 5 mm dual-row RF Land Grid Array (RFLGA) package. A functional block diagram is shown in Figure 1.

Figure 1. SKY74218 RF Transceiver Block Diagram

**Ordering Information**

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<th>Model Name</th>
<th>Manufacturing Part Number</th>
<th>Product Revision</th>
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<tr>
<td>SKY74218 RF Transceiver</td>
<td>SKY74218-11 (Pb-free package)</td>
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