PRODUCT SUMMARY

Helios™ DigRF Subsystem for GSM, GPRS, and EDGE Mobile Handset Applications

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

Features
- Polar Loop™ transmit modulation architecture
- No delay adjustment required
- High-speed asynchronous serial ports for interface to baseband processor, compliant with v1.12 of the DigRF standard
- Fully integrated and programmable ΣΔ fractional-N synthesizer suitable for multi-slot EGPRS operation
- Single cell, 3.1 V to 4.5 V lithium-ion battery operation with no external regulation required
- Low external component count
- Integrated loop filters: UHF, transmit AM, transmit PM
- Supports multi-slot GPRS and EDGE applications up to Class 34
- GMSK and 8-PSK digital modulators
- ΣΔ ADCs for digitization of baseband receive signals
- DACs for conversion of the GMSK/8-PSK modulator output
- PA saturation detection and correction circuit
- Programmable receive filter coefficients
- Small footprint of less than 210 mm²

Skyworks offers lead (Pb)-free RoHS (Restriction of Hazardous Substances) compliant packaging.

Description
Skyworks Helios™ Digital RF (DigRF) Subsystem combines a direct conversion transceiver and a transmit/receive (T/R) Front-End Module (FEM) with a T/R switch and coupler into a dual-chip radio solution that saves significant space, cost, and design cycle time while providing world-class GSM, GPRS, and EDGE performance.

All of the necessary RF components needed to build a quad-band, multi-standard handset have been incorporated into the Helios DigRF Subsystem. It allows a direct interface to a digital baseband with a DigRF interface. The highly integrated subsystem includes Skyworks SKY74200 RF transceiver and SKY77520 T/R FEM.

This subsystem uses Skyworks advanced Polar Loop transmit modulation architecture. This unique architecture enables the radio to transmit both constant as well as non-constant envelope signals through the same transmit path to minimize the number of external components required to build a mobile handset. As a result, the complexity, size, cost, and power requirements of next-generation EDGE platforms are greatly reduced.

The SKY74200 implements Skyworks innovative direct conversion transceiver architecture. This allows the highly integrated device to be combined with virtually any standard GSM/EGPRS baseband without requiring any special processing interfaces.

The transceiver consists of four integrated Low Noise Amplifiers (LNAs), a quadrature demodulator, selectable baseband filter bandwidths, and low-droop DC Offset Correction (DCOC) sequencer. The device integrates all necessary Low Drop Out (LDO) voltage regulators that generate the required device power supplies from the battery input. Together with the SKY77520 FEM, a seamless closed-loop transmit system is formed.

The SKY74200 is fabricated using BiCMOS technology and is available in a 64-pin, 7 x 11 x 1.15 mm Multi-Chip Module (MCM) Pb-free package.

The SKY77520 incorporates separate GSM850/EGSM900 and DCS1800/PCS1900 PA blocks, a PAC block, impedance-matching circuitry for 50 Ω inputs and outputs, transmit harmonics filtering, an integrated coupler, high linearity and low insertion-loss PHEMT RF switches, and a diplexer. The SKY77520 is fabricated using InGaP technology and is available in a 28-pin, 8 x 8 x 1.45 mm MCM package.

A functional block diagram for the Helios DigRF Subsystem is shown in Figure 1.
Figure 1. Helios DigRF Subsystem Functional Block Diagram

### Ordering Information

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<th>Model Name</th>
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<tr>
<td>SKY74200 RF Transceiver</td>
<td>SKY74200-11 (Pb-free package)</td>
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<tr>
<td>SKY77520 T/R FEM</td>
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