

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 $\Sigma\Delta$ 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
- $\Sigma\Delta$ 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.

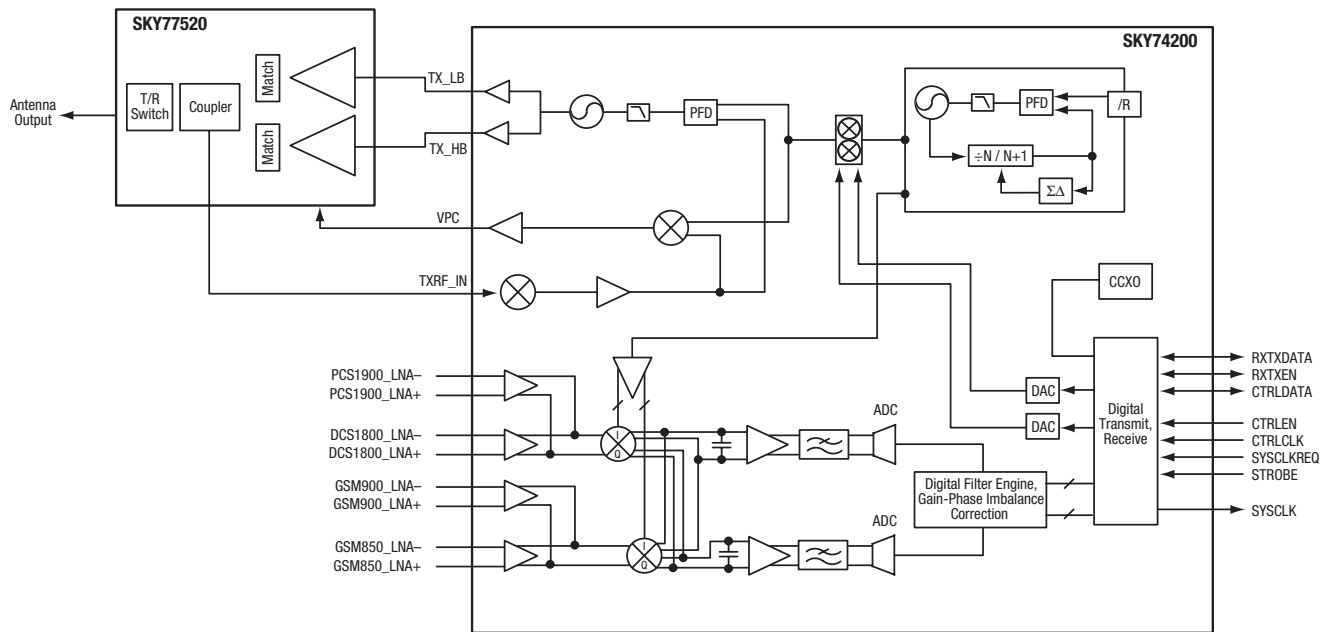
The transceiver consists of four integrated Low Noise Amplifiers (LNAs), a quadrature demodulator, selectable baseband filter bandwidths, and low-droop DC Offset Correction (DCOC) sequencer. The device integrates all necessary Low Drop Out (LDO) voltage regulators that generate the required device power 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.

PRODUCT SUMMARY • HELIOS DIGRF SUBSYSTEM



S705

Figure 1. Helios DigRF Subsystem Functional Block Diagram

Ordering Information

Model Name	Manufacturing Part Number	Product Revision
Helios DigRF Subsystem: SKY74200 RF Transceiver	SKY74200-11 (Pb-free package)	
SKY77520 T/R FEM	SKY77520 (Pb-free package)	

Copyright © 2005, Skyworks Solutions, Inc. All Rights Reserved.

Information in this document is provided in connection with Skyworks Solutions, Inc. ("Skyworks") products or services. These materials, including the information contained herein, are provided by Skyworks as a service to its customers and may be used for informational purposes only by the customer. Skyworks assumes no responsibility for errors or omissions in these materials or the information contained herein. Skyworks may change its documentation, products, services, specifications or product descriptions at any time, without notice. Skyworks makes no commitment to update the materials or information and shall have no responsibility whatsoever for conflicts, incompatibilities, or other difficulties arising from any future changes.

No license, whether express, implied, by estoppel or otherwise, is granted to any intellectual property rights by this document. Skyworks assumes no liability for any materials, products or information provided hereunder, including the sale, distribution, reproduction or use of Skyworks products, information or materials, except as may be provided in Skyworks Terms and Conditions of Sale.

THE MATERIALS, PRODUCTS AND INFORMATION ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE, INCLUDING FITNESS FOR A PARTICULAR PURPOSE OR USE, MERCHANTABILITY, PERFORMANCE, QUALITY OR NON-INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHT; ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED. SKYWORKS DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. SKYWORKS SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO ANY SPECIAL, INDIRECT, INCIDENTAL, STATUTORY, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS THAT MAY RESULT FROM THE USE OF THE MATERIALS OR INFORMATION, WHETHER OR NOT THE RECIPIENT OF MATERIALS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Skyworks products are not intended for use in medical, lifesaving or life-sustaining applications, or other equipment in which the failure of the Skyworks products could lead to personal injury, death, physical or environmental damage. Skyworks customers using or selling Skyworks products for use in such applications do so at their own risk and agree to fully indemnify Skyworks for any damages resulting from such improper use or sale. Customers are responsible for their products and applications using Skyworks products, which may deviate from published specifications as a result of design defects, errors, or operation of products outside of published parameters or design specifications. Customers should include design and operating safeguards to minimize these and other risks. Skyworks assumes no liability for applications assistance, customer product design, or damage to any equipment resulting from the use of Skyworks products outside of stated published specifications or parameters.

Skyworks, the Skyworks symbol, Polar Loop, and "Breakthrough Simplicity" are trademarks or registered trademarks of Skyworks Solutions, Inc., in the United States and other countries. Third-party brands and names are for identification purposes only, and are the property of their respective owners. Additional information, including relevant terms and conditions, posted at www.skyworksinc.com, are incorporated by reference.