SKY74088: SPR™ Module for Tri-Band GSM and GPRS Handset Applications

Applications

- EGSM900, DCS1800, and PCS1900 cellular handsets encompassing:
  - Class 4 EGSM900
  - Class 1 DCS1800
  - Class 1 PCS1900
- GPRS Class 10 handsets and modules

Features

- Fully integrated transceiver, PA, PA control circuitry, antenna switch, diplexer, transmit harmonic filters, and SAW filters
- Low external component count. Requires only one external crystal and two low-cost capacitors
- Integrated DCOC sequencer
- Single Integrated, fully programmable fractional-N synthesizer suitable for multi-slot GPRS operation
- Integrated crystal oscillator circuitry
- Meets AM suppression requirements
- Low power standby mode
- Gold plated, lead-free contacts
- Compact, 40-pin 13 x 13 x 1.8 mm laminate MCM package

Description

The SKY74088 SPR™ module combines all of the circuitry required to design a tri-band EGSM900, DCS1800, and PCS1900 radio into the world's smallest single package module. This small package is approximately one-third the size of alternative radio solutions and uses Skyworks low cost, multi-layer laminate substrate technology. The SKY74088 can save handset designers significant space and design-cycle time while providing a roadmap for future multi-band and 3G applications.

The SPR module contains Skyworks certified Full Type Approval (FTA), single-chip BiCMOS direct conversion transceiver technology. Direct conversion architecture eliminates costly Intermediate Frequency (IF) conversion steps while reducing the number of components required to support multi-band Global System for Mobile Communications/General Packet Radio Service (GSM/GPRS) handsets. Agile channel switching enables support of GPRS multi-slot operations. Translation loop architecture is used in the transmit path. Transmit loop filters and all supporting circuitry are also integrated in the SPR module. Impedance matching for the 50 Ω antenna port, I/O bias control circuitry, and DC blocking circuitry are integrated into the module.

Two separate Heterojunction Bipolar Transistor (HBT) Power Amplifier (PA) blocks are fabricated on a single Gallium Arsenide (GaAs) die to provide maximum performance with the smallest possible footprint. Optimized for lithium ion battery operation, both PA blocks share common power supply pins. A custom CMOS integrated circuit provides the internal interface to the PA. The CMOS PA controller die also provides the antenna switch decoding functionality. Transmit low pass circuitry designed to filter out signal harmonics, a diplexer, and three receive Surface Acoustic Wave (SAW) filters are also integrated in the radio module.

The front-end radio circuitry uses two of Skyworks high performance, low current consumption Pseudomorphic High Electron Mobility Transistor (PHEMT) switches: one Single Pole Double Throw (SPDT) GaAs switch, and one Single Pole Triple Throw (SPTT) GaAs switch. The switches typically draw less than 10 μA of current during operation and are designed for low insertion loss and high linearity performance. Electrostatic Discharge (ESD) protection circuitry is integrated into the SPR module and ensures the module's ruggedness under extreme conditions.

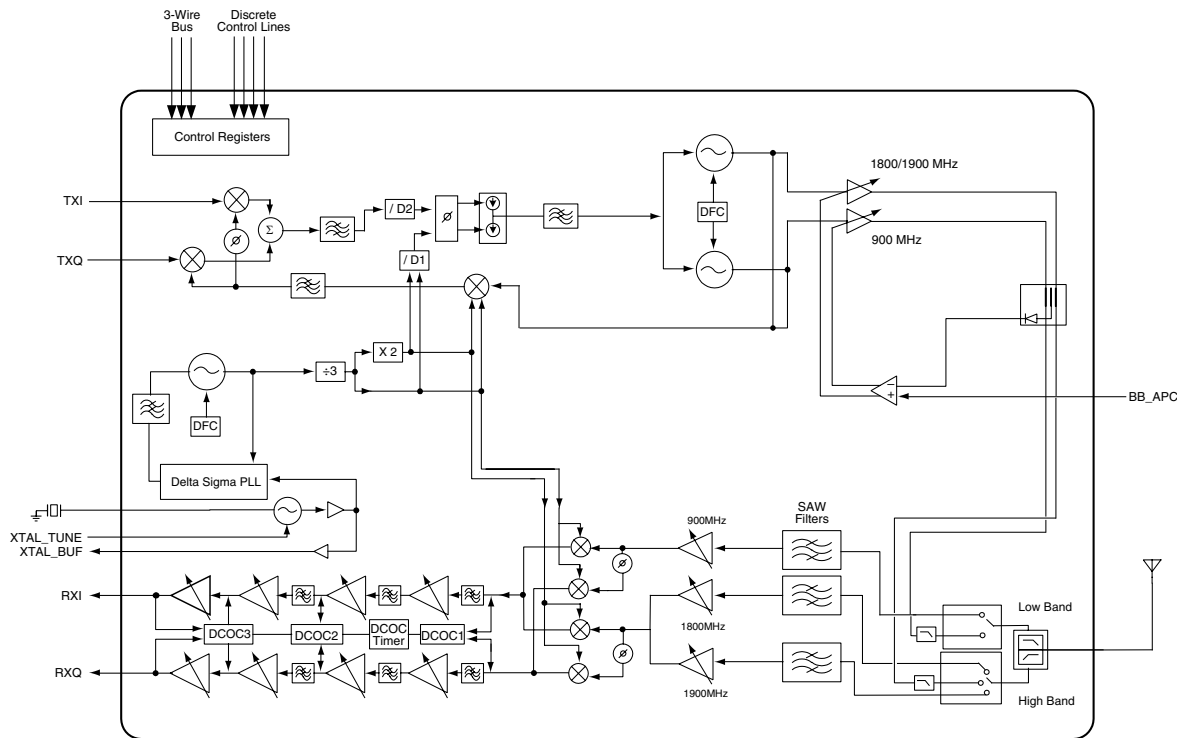A functional block diagram of the SKY74088 is shown in Figure 1.

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Figure 1. SKY74088 SPR Module Functional Block Diagram

Ordering Information

Model Name	Manufacturing Part Number	Product Revision
SKY74088 Tri-Band SPR Module	SKY74088-11	

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