PRELIMINARY PRODUCT SUMMARY

SKY77506 TX–RX iPAC™ FEM for Quad-Band GSM/GPRS

Applications

- Quad-band cellular handsets encompassing
  - Class 4 GSM850/900
  - DCS1800
  - PCS1900
  - Class 12 GPRS multi-slot operation

Features

- High efficiency
  - GSM850 47%
  - GSM900 46%
  - DCS 43%
  - PCS 42%
- Low transmit supply current
  - GSM850 1.21 A
  - GSM900 1.24 A
  - DCS1800 0.67 A
  - PCS1900 0.68 A
- Internal ICC sense resistor for iPAC
- Closed loop iPAC
- 50 Ω matched Input/Output
  - internal with DC blocking
- Antenna ESD Protection – 8 kV
- TX–VCO-to-antenna and antenna-to-RX-SAW filter RF interface
- TX harmonics below –35 dBm
- PHEMT RF switches afford high linearity, low insertion loss, and less than 20 µA supply current in receive modes
- Small outline 8 mm x 8 mm
- Low profile 1.25 mm max.
- Compatible with multiple logic families
- Low APC current 25 µA
- Gold plated, lead free contacts

NEW

Skyworks offers lead (Pb)-free "environmentally friendly" packaging that is RoHS compliant (European Parliament for the Restriction of Hazardous Substances).

Description

The SKY77506 is a transmit and receive front-end module (FEM) with Integrated Power Amplifier Control (iPAC™) for quad-band cellular handsets comprising GSM850/900, DCS1800, and PCS1900 operation. Designed in a low profile, compact form factor, the SKY77506 offers a complete Transmit VCO-to-Antenna and Antenna-to-Receive SAW filter solution. The FEM also supports Class 12 General Packet Radio Service (GPRS) multi-slot operation.

The module consists of a GSM850/900 PA block and a DCS1800/PCS1900 PA block, impedance-matching circuitry for 50 Ω input and output impedances, TX harmonics filtering, high linearity and low insertion loss PHEMT RF switches, diplexer and a Power Amplifier Control (PAC) block with internal current sense resistor. A custom BiCMOS integrated circuit provides the internal PAC function and decoder circuitry to control the RF switches. The two Heterojunction Bipolar Transistor (HBT) PA blocks are fabricated onto a single Gallium Arsenide (GaAs) die. One PA block supports the GSM850/900 bands and the other PA block supports the DCS1800 and PCS1900 bands. Both PA blocks share common power supply pads to distribute current. The output of each PA block and the outputs to the four receive pads are connected to the antenna pad through PHEMT RF switches and a diplexer. The GaAs die, PHEMT die, Silicon (Si) die and passive components are mounted on a multi-layer laminate substrate. The assembly is encapsulated with plastic overmold.

Band selection and control of transmit and receive modes are performed using three external control pads. Refer to the functional block diagram in Figure 1 below. The two band select pads (BS1, BS2) select between GSM and DCS/PCS modes of operation. The transmit enable (TX_EN) pad controls receive or transmit mode of the respective RF switch (TX = logic 1). Proper timing between transmit enable (TX_EN) and Analog Power Control (VRAMP) allows for high isolation between the antenna and TX-VCO while the VCO is being tuned prior to the transmit burst. The TX_EN input allows initial turn-on of the PAC circuitry to minimize battery drain.

The SKY77506 is compatible with logic levels from 1.2 V to VCC for BS1, BS2, and TX_EN pads, depending on the level applied to the VLOGIC pad. This feature provides additional flexibility for the designer in the selection of FEM interface control logic.

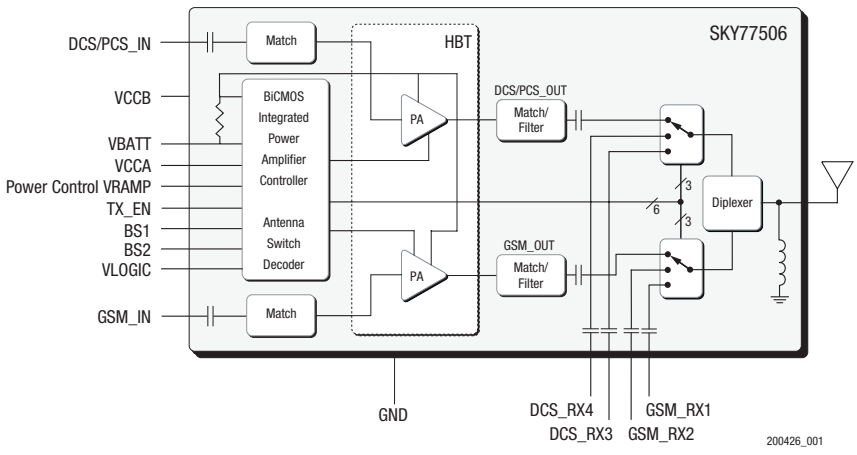

Figure 1. Functional Block Diagram