

PRODUCT SUMMARY

# SKY77547 Tx–Rx iPAC™ Front-End Module – 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
  - 44% (GSM)
  - 42% (DCS/PCS)
- Low transmit supply current
  - 1.30 A (GSM)
  - 0.86 A (DCS/PCS)
- Internal ICC sense resistor for iPAC
- Closed loop iPAC
- 50 Ω matched Input/Output
- Tx–VCO-to-antenna and antenna-to-Rx-SAW filter RF interface
- Tx harmonics below –33 dBm
- PHEMT RF switch affords high linearity, low insertion loss, and less than 20 μA supply current in receive modes
- Small, low profile package
  - 8 mm x 6 mm x 1.05 mm
  - 30-pad configuration
- Compatible with multiple logic families
- Low APC current: 25 μA

**NEW** Skyworks Green™ products are RoHS (Restriction of Hazardous Substances)-compliant, conform to the EIA/EICTA/JEITA Joint Industry Guide (JIG) Level A guidelines, are halogen free according to IEC-61249-2-21, and contain < 1,000 ppm antimony trioxide in polymeric materials.




## Description

The SKY77547 is a transmit and receive front-end module (FEM) with Integrated Power Amplifier Control (iPAC™) for quad-band cellular handsets comprising GSM850/900 and DCS1800/PCS1900 operation. Designed in a low profile, compact form factor, the SKY77547 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 a low insertion loss PHEMT RF switch, 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/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 a PHEMT RF switch. 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 are performed using four external control pads. Refer to the block diagram in Figure 1 below. The band select pads, BS1 and BS2, select GSM850, GSM900, DCS, and PCS modes of operation. Transmit enable Tx\_EN controls receive or transmit mode of the 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 SKY77547 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.

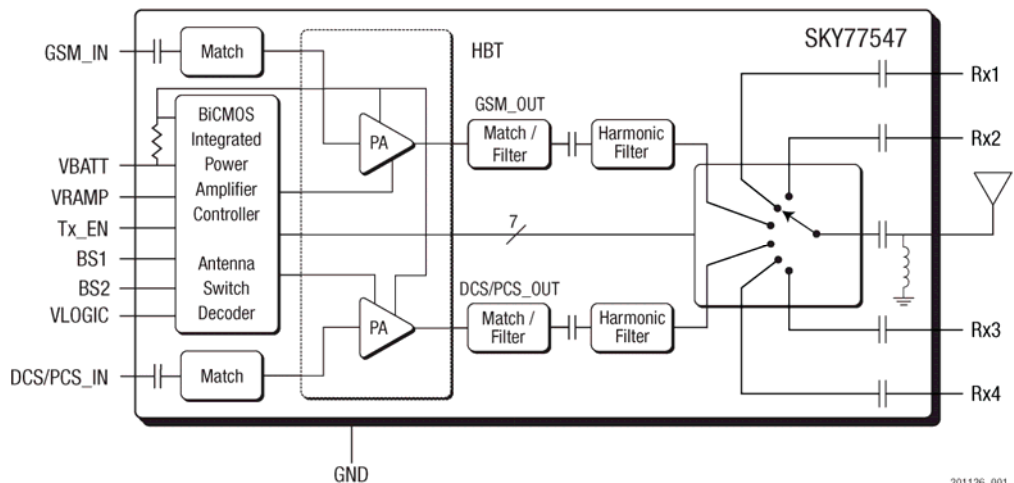


Figure 1. SKY77547 Functional Block Diagram

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