

**PRODUCT SUMMARY**

# SKY77552 Quad-Band Tx / Dual-Band Rx iPAC™ FEM for GSM / GPRS (824–915 MHz and 1710–1910 MHz)

**Applications**

- U.S. or Euro dual-band cellular handsets encompassing
  - Class 4 GSM850/900
  - DCS1800/PCS1900
  - Class 12 GPRS multi-slot operation

**Features**

- High efficiency
  - 43.5% GSM
  - 37.5% DCS/PCS
- Low transmit supply current
  - 1.31 A GSM
  - 0.96 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
- PHEMT RF switches afford high linearity, low insertion loss, and less than 20 μA supply current in receive modes
- Small, low profile package
  - 7 x mm 6 mm x 0.9 mm
- Compatible with multiple logic families
- Low VRAMP 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.



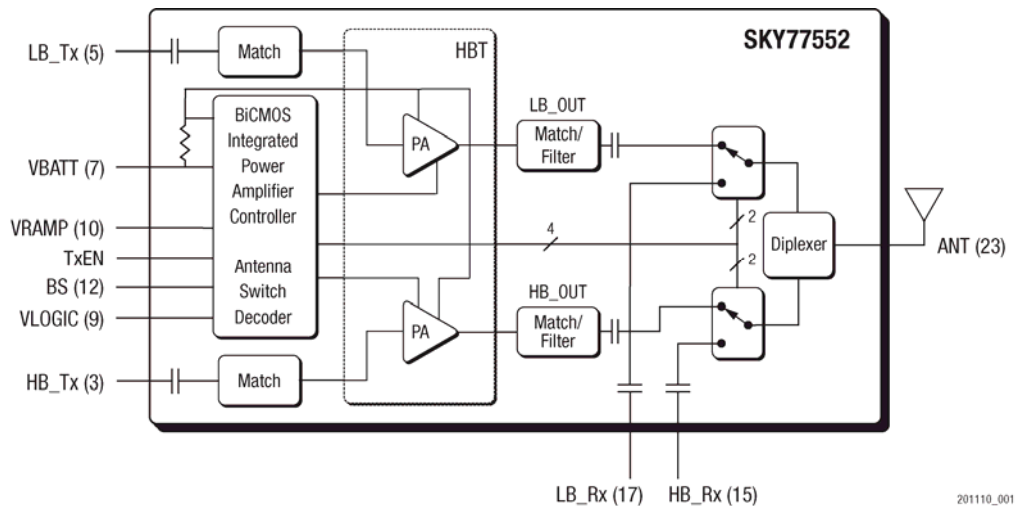

**Description**

The SKY77552 is a quad-band transmit and dual-band receive front-end module (FEM) with Integrated Power Amplifier Control (iPAC™) for cellular handsets comprising GSM and DCS/PCS operation. The FEM has quad-band capability in applications of U.S. or Euro dual-band platforms. Designed in a low profile, compact form factor, the SKY77552 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 GSM PA block and a DCS/PCS 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 GSM band and the other PA block supports the DCS/PCS band. Both PA blocks share common power supply pads to distribute current. The output of each PA block and the outputs to the two 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 two external control pads. Refer to the functional block diagram in Figure 1. The band select pad (BS) selects between GSM and DCS/PCS modes of operation. The transmit enable (TxEN) pad controls receive or transmit mode of the respective RF switch (Tx = logic 1). Proper timing between transmit enable (TxEN) 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 SKY77552 is compatible with logic levels from 1.2 V to VCC for BS and TxEN 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**

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