SKYWORKS

PRODUCT SUMMARY

SKY77555 Tx–Rx FEM Based on CMOS PA for Dual-Band GSM / GPRS (880–915 MHz and 1710–1785 MHz)

Applications

- Dual-band cellular handsets encompassing
  - Class 4 GSM900
  - DCS1800
  - Class 12 GPRS multi-slot operation

Features

- Efficiency
  - 36% GSM (33.0 dBm)
  - 29% DCS (30.5 dBm)
- Log linear power control response with <100 dB/V power control slope
- Low Rx band noise
- Supply current
  - 1.58 A GSM (33.0 dBm)
  - 1.10 A DCS (30.5 dBm)
- Fully integrated closed loop
- 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 low current in receive modes
- Small, low profile package
  - 5 mm x 6 mm x 1.05 mm
- Compatible with multiple logic families

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Description

The SKY77555 is a transmit and receive front-end module (FEM) based on CMOS Power Amplifier for dual-band cellular handsets comprising GSM900 and DCS1800 operation. Designed in a low profile, compact form factor, the SKY77555 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 GSM900/DCS1800 CMOS PA, Tx harmonics filtering, high linearity and low insertion loss PHEMT RF switches, and diplexer. The CMOS device integrates a full dual-band GSM/GPRS power amplifier function. High accuracy power control and ramping is achieved on the CMOS chip via a closed loop power control system. Current drain is limited under load mismatch conditions via the nature of the innovative power control circuit. The output of the CMOS PA die and the outputs to the two receive pads are connected to the antenna pad through PHEMT RF switches and a diplexer. The CMOS die, PHEMT 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 modes of operation. The transmit enable (TxEN) pad controls the 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 SKY77555 is compatible with logic levels from 1.6 V to 2.8 V 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.

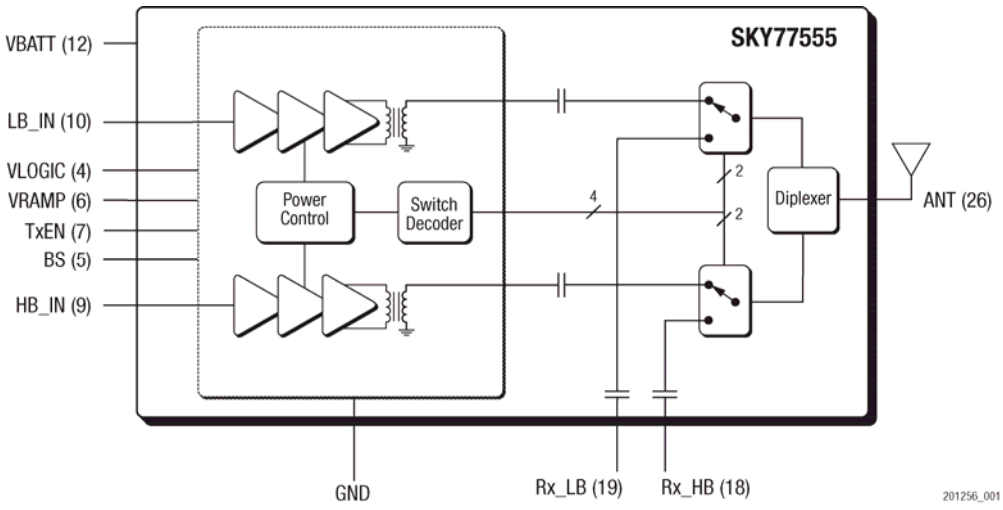

Figure 1. SKY77555 Functional Block Diagram

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