

PRELIMINARY PRODUCT SUMMARY

SKY77520 TX-RX Front-End Module with Integrated Coupler for Quad-Band GSM / EDGE—Helios System 2.5

Applications

- Quad-band cellular handsets:
 - Class 4 GSM850/900
 - DCS1800
 - PCS1900
 - Class 12 EGPRS multi-slot operation
 - Class 34 EGPRS multi-slot operation
 - EDGE polar modulation

Features

- High efficiency:
 - GSM850 45% (Peak)
 - GSM900 45% (Peak)
 - DCS 38% (Peak)
 - PCS 38% (Peak)
- Integrated coupler
- Wideband envelope control path
- Input/output matching
- 28-pad MCM
- Small outline
 - 8 x 8 mm
- Low profile
 - 1.5 mm
- 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 SKY77520 is a transmit-receive Front-End Module (FEM) designed in a compact form factor for quad-band cellular handsets comprising GSM850/900, DCS1800, PCS1900 operation—a complete transmit-VCO-to-Antenna and Antenna-to-receive SAW filter solution.

The module consists of separate GSM850/900 and DCS1800/PCS1900 PA blocks, a Power Amplifier Control (PAC) block, impedance-matching circuitry for 50 Ω inputs and outputs, TX harmonics filtering, an integrated coupler, high-linearity and low insertion-loss PHEMT RF switches, and a diplexer. A custom CMOS integrated circuit provides the internal PAC function, interface circuitry, and decoder circuitry to control the RF switches.

Two Heterojunction Bipolar Transistor (HBT) PA blocks are separately fabricated onto Indium Gallium Phosphide (InGaP) dies; one block supports the GSM850/900 bands, the other supports the DCS1800 and PCS1900 bands. Both PA blocks share common power supply pads to distribute current. Outputs from the PA blocks and the four receive pads connect to the antenna via PHEMT RF switches and the diplexer. The InGaP dies, the Silicon (Si) die, the PHEMT die, and the passive components are mounted on a multi-layer laminate substrate and the entire assembly encapsulated with plastic overmold.

Three external control pads facilitate band selection and control of the transmit and receive RF signal flows. BS0 and BS1 select GSM, DCS, or PCS modes. TR_EN selects transmit or receive mode of the respective RF switch. Proper timing of the logic of TR_EN, BS0 and BS1, and Power Control (VPC) allows high isolation between the antenna and TX_VCO while VCO is being tuned prior to the transmit burst. See the functional block diagram (Figure 1) below.

PAC_EN input allows initial turn-on of the PAC circuitry to minimize battery drain. Low leakage current (6.5 μA, typical) of the dual PA module maximizes handset standby time.

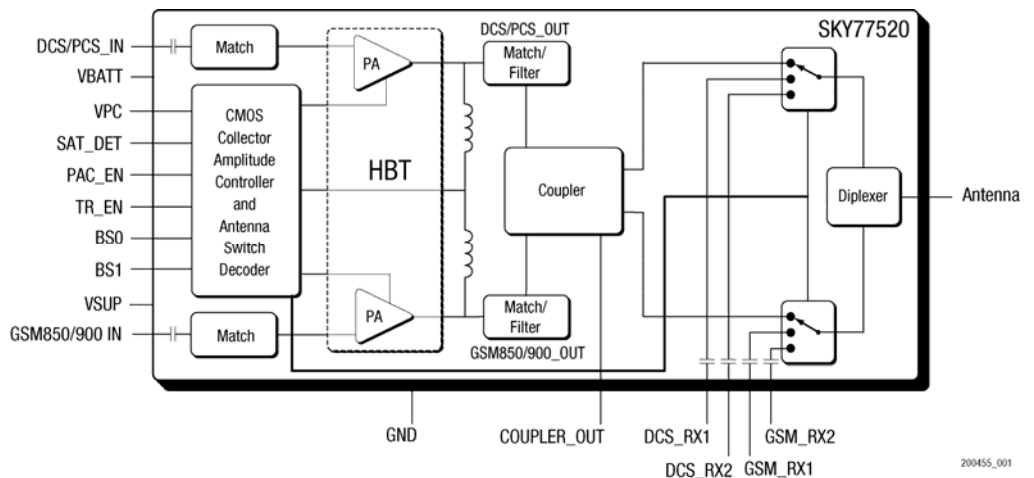


Figure 1. SKY77520 Functional Block Diagram

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