

PRODUCT SUMMARY

# SKY77546 Tx–Rx Front-End Module for Dual-Band GSM / GPRS / EDGE

## Applications

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

## Features

- High efficiency
  - 45% (GSM900)
  - 40% (DCS1800)
- Current limiting for protection and extended battery life
- Input/Output internally matched 50 Ω
- TX–VCO-to-antenna and antenna-to-RX-SAW filter RF interface
- TX harmonics below –36 dBm
- Small, low profile package
  - 7 mm x 6 mm x 0.9 mm
  - 30-pad configuration
- Low APC current: 15 μA

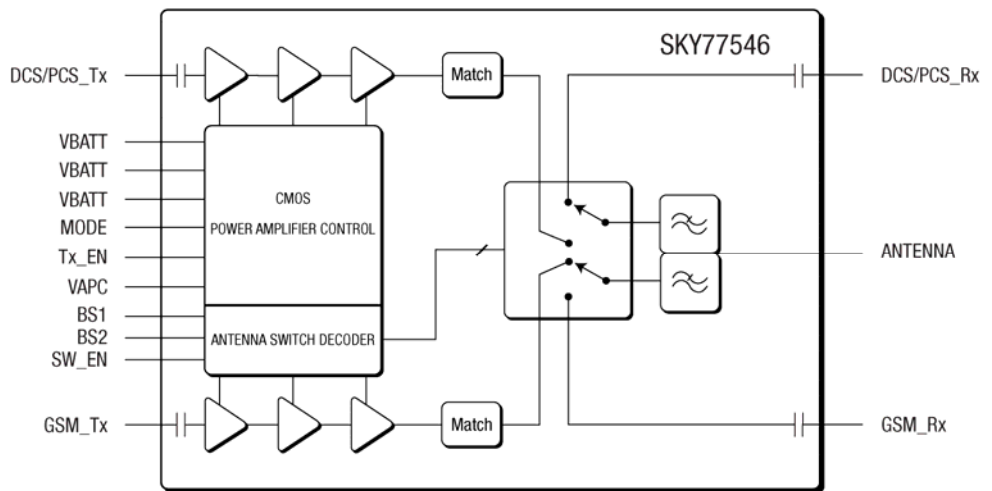
## Description

The SKY77546 is a transmit and receive Front-End Module (FEM) designed in a compact form factor for dual-band cellular handsets comprising GSM900 and DCS1800 operation. The SKY77546 offers a complete Transmit VCO-to-Antenna and Antenna-to-Receive SAW filter solution that supports Class 12 General Packet Radio Service (GPRS) multi-slot operation and EDGE operation for handsets and modules.

The module consists of a GSM900 PA block and a DCS1800 PA block, impedance-matching circuitry for 50 Ω input and output impedances, TX harmonics filtering, high linearity and low insertion loss RF switches, and a Power Amplifier Control (PAC) block. A custom CMOS integrated circuit provides the internal PAC function, external interface circuitry, and decoder circuitry to control the RF switches. The integrated PAC function provides envelope amplitude control by reducing sensitivity to input drive, temperature, power supply, and process variations. The Heterojunction Bipolar Transistor (HBT) PA blocks are fabricated onto a single InGaP/GaAs die. One PA block supports the GSM900 band and the other PA block supports the DCS1800 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 a diplexer and SP2T switch. The GaAs die, switch 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 RF signal flows are performed using five external control pads. The band select pad (BS) selects GSM or DCS modes of operation. The TxEN pad selects receive or transmit mode of the respective RF switch (Tx = logic 1). SW\_EN provides improved isolation for flexibility in control timing to meet the required time mask. MODE configures the amplifier for GMSK operation (MODE = 0) or linear EDGE operation (MODE = 1). Proper timing of the logic on these pads, and Analog Power Control (APC) allows for high isolation between the antenna and Tx-VCO while the VCO is being tuned prior to the transmit burst. Standby mode provides a low-current consumption state. Low leakage current (6.5 μA, typical) of the dual PA module maximizes handset standby time.

**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.

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Figure 1. Functional Block Diagram

## Ordering Information

Model Number	Manufacturing Part Number	Product Revision	Package	Operating Temperature
SKY77546	SKY77546		MCM 7 mm x 6 mm x 0.9 mm	-20 °C to +85 °C

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