SKY77529 Tx Front-End Module for Quad-Band GSM / EDGE

Applications

- Quad-band cellular handsets:

  GMSK Modulation:
  - Class 4 GSM850/900
  - Class 1 DCS1800/ PCS1900
  - Class 12 GPRS multi-slot operation

  EDGE modulation:
  - Class E2 GSM850/900
  - Class E2 DCS1800/ PCS1900

Features

- WCDMA pass-through
  - 4 linear ports
- TRP-compliant design
- SPI bus support
- Low loss PHEMT RF antenna switch
- Detector output: linear V/V
- Closed loop GMSK mode power control
- Small outline
  - 7.5 x 7 mm
- Low profile
  - 0.9 mm MAX.
- Gold-plated, lead-free contacts
- Low V$_{RAMP}$ current

Description

The SKY77529 Tx Front End Module (FEM) is designed in a compact form factor for quad-band cellular handsets comprising GSM850/900, DCS1800, PCS1900, supporting GMSK and linear EDGE modulation. Class 12 General Packet Radio Service (GPRS) multi-slot operation is also supported.

The module consists of a GSM850/900 PA block and a DCS1800/PCS1900 PA block, a printed directional coupler for each block impedance-matching circuitry for 50 Ω input and output impedances, a multifunction power amplifier control (MFC) block, low pass harmonic rejection filters, and an SP8T Antenna T/R switch. The T/R switch incorporates four linear ports to allow WCDMA parallel operation.

Two separate Heterojunction Bipolar Transistor (HBT) PA blocks are fabricated onto an InGaP die; one supports the GSM850/900 bands, the other supports the DCS1800 and PCS1900 bands. The InGaP PA die, the silicon MFC die, PHEMT switch die, and the passive components are mounted on a multi-layer laminate substrate. The assembly is encapsulated with plastic overmold.

The FEM incorporates full support for a Serial Peripheral Interface (SPI) bus function. The SPI controller shall accept SPI telegrams with data fields that support PA and switchplexer-related functions. All FEM operating modes and switch states shall be determined by the SPI telegram.

The Multi-function Control (MFC) provides for interoperation with a specified transceiver that will establish a closed loop power control mechanism. The external circuit uses the Linear Detector output to set a fixed bias point for 8PSK (EDGE) mode and a variable bias point for GMSK (GSM) mode. The power control loop together with the MFC will reduce sensitivity to antenna load, input drive, temperature, power supply, and process variation. The combined circuit configures the PA for fixed gain in 8PSK mode while providing the ability to optimize the PA bias at different power levels to maximize efficiency.
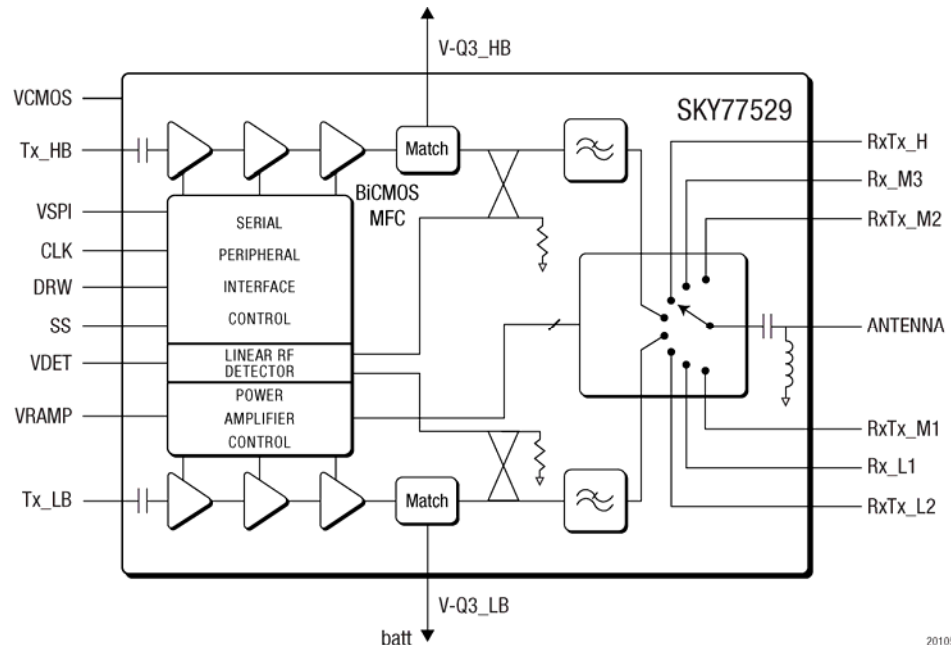

Figure 1. SKY77529 Functional Block Diagram

Ordering Information

Model Number	Manufacturing Part Number	Product Revision	Package	Operating Temperature
SKY77529	SKY77529		7.5 x 7 x 1.05 mm	−20 °C to +85 °C