PRODUCT SUMMARY

SKY77316: PA Module for Quad-Band GSM / GPRS / EDGE

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

Features
- Low input power 0–6 dBm
- High efficiency:
  - GSM850 49%
  - GSM900 53%
  - PCS 53%
  - DCS 53%
- Wideband VAPC control path
- Integrated noise filtering
- Input/output matching
- 22-pad MCM Package
- Small outline
  - 6 mm x 8 mm
- Low profile
  - 1.2 mm
- Gold-plated, lead-free contacts

The SKY77316 Power Amplifier Module (PAM) is designed in a compact form factor for quad-band cellular handsets comprising GSM850/900, DCS1800, and PCS1900 operation. The PAM also supports Class 12 General Packet Radio Service (GPRS) multi-slot operation.

The module consists of a GSM850/900 PA block and a DCS1800/PCS1900 PA block, impedance-matching circuitry for 50 Ω input and output impedances, and a Power Amplifier Control (PAC) block. A custom BiCMOS integrated circuit provides the internal PAC function and interface circuitry.

The two separate Heterojunction Bipolar Transistor (HBT) PA blocks are fabricated onto a single Gallium Arsenide (GaAs) die. One PA block supports the GSM850/900 bands, and the other PA block supports the DCS1800 and PCS1900 bands. Both PA blocks share common power supply pads to distribute current. The GaAs die, the silicon die, and the passive components are mounted on a multilayer laminate substrate. The assembly is encapsulated with plastic overmold.

The RF input and output ports are internally matched to 50 Ω to reduce the number of external components for a quad-band design. Extremely low leakage current (10 µA, typical) of the dual PA module maximizes handset standby time. The SKY77316 also contains band select switching circuitry to select GSM (logic 0) and DCS/PCS (logic 1) as determined from the Band Select (B_SEL) signal. In the functional block diagram shown in Figure 1, the B_SEL pad selects the PA output (LB_OUT or HB_OUT) while the Analog Power Control (VAPC) controls the level of output power.

The integrated power amplifier control (PAC) function provides envelope amplitude control by reducing sensitivity to input drive, temperature, power supply, and process variation while providing the necessary noise filtering for the overall system power control feedback. The TX_EN input signal (pad 2) allows initial turn-on of the PAC circuitry to minimize battery drain.

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Figure 1. Functional Block Diagram
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