

PRODUCT SUMMARY

# SKY78027-12 SkyOne™ Multimode Multiband Tx Front-End Module for Quad-Band GSM/GPRS/EDGE – WCDMA/HSPA/HSPA+/LTE/CDMA

## Applications

- Quad-band cellular handsets:
  - Class 4 GSM850/EGSM900
  - Class 1 DCS1800/PCS1900
  - Class E2 GSM850/EGSM900/DCS1800/PCS1900
  - Class 12 multi-slot EGPRS
- Multiband 3G handsets
- WCDMA/HSPA/HSPA+/LTE-modulated handsets for bands 1, 2, 3, 5, 8, 20
- CDMA modulated handsets for bands BC0, BC1, BC6

## Features

- PA core optimized to meet or exceed best-in-class APT performance
- Hybrid architecture: separate GSM, CDMA, WCDMA Tx paths
- 50 Ω I/O impedances, integrated DC blocking on all ports
- Integrated duplexers for bands 1, 2, 3, 5, 8
- Integrated ESD protection post-ASM (meets IEC requirements)
- MIPI RFFE Control Interface w/1.8 V nominal supply, separate VCC1/VCC2, completely operable for VIO high/VBATT low, continuous bias adjustment vs. power
- Small, low profile package:
  - 8 mm x 9 mm x 0.9 mm
  - 60-pad configuration

### • 2.5G Features:

- EGPRS Class 12 multi-slot operation
- Two RF POUT control levels using digital logic interface
- Linear PA with bias optimization for efficiency/linearity trade-off in 8PSK mode

### • 3G Features:

- WCDMA mode supports output power, bandwidth for bands 1, 2, 3, 5, 8, 20 via integrated select switch
- CDMA mode supports output power, bandwidth for BC0, BC1, BC6 via integrated select switch
- Linear amplifiers with bias optimization and low/high mode gain switch for best efficiency/linearity tradeoff

### • 4G Features:

- LTE supports output power, bandwidth bands 1, 2, 3, 5, 8, 20
- Bands 1, 2, 3, 20 up to 20 MHz bandwidth
- Bands 5, 8 up to 10 MHz bandwidth

### • TDD Features:

- TD-SCDMA mode supports output power and bandwidth for bands 34 and 39 via an integrated select switch
- TD-LTE mode supports output power and bandwidth for band 39 via an integrated select switch



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**Description**

The SKY78027-12 SkyOne™ Multimode Multiband (MMMB) Front-End Module (FEM) supports 2.5G, 3G/4G, and CDMA handsets and operates efficiently in GSM, GPRS, EDGE, WCDMA, HSPA, and LTE modes. The FEM consists of a GSM800/EGSM900 PA block, a DCS1800/PCS1900 PA block, separate WCDMA blocks operating in the low and high bands, duplexers for bands 1, 2, 3, 5, and 8, a logic control block for multiple power control levels, and band enable functions in both cellular and UMTS. RF I/O ports internally matched to 50 Ω, minimize the need for external components. Extremely low leakage current maximizes handset standby time. The InGaP/GaAs die and passive components are mounted on a multi-layer laminate substrate and the assembly encapsulated in plastic over-mold.

**Filter Integration:** Duplexers for bands 1, 2, 3, 5, and 8 are designed into the SKY78027-12. This produces a highly integrated front-end solution wherein PA matching is accomplished with pre- and post- duplexer matching circuits which eliminates any required tuning outside the module. This highly integrated solution significantly reduces time-to-market and also provides the smallest RF footprint which yields more space for form factor designers.

**GSM/EDGE:** The SKY78027-12 with new compact architecture, supports the GSM850, EGSM900, DCS1800 and PCS1900 bands, as well as 2.5G Class 12 Enhanced General Packet Radio Service (EGPRS) multi-slot operation and EDGE linear modulation.

**WCDMA:** The SKY78027-12 enhanced architecture supports WCDMA/High-Speed Downlink Packet Access (HSDPA) and High-Speed Uplink Packet Access (HSUPA) modulations, covers multiple bands for 3GPP including bands 1, 2, 3, 5, and 8, and operates at different power modes. The module is fully controllable via a MIPI serial interface.

**LTE:** SKY78027-12 meets spectral linearity requirements of LTE modulation with QPSK/16QAM up to 20 MHz bandwidth, including various resource block allocations with good power-added efficiency.

**CDMA:** SKY78027-12 meets spectral linearity requirements of CDMA 2K and EVDO Release A modulation with good power-added efficiency.

**Receiver Section:** The integrated Duplexers, RX SAWs, and SP16T SOI switch of the SKY78027-12 provide 2G/3G/4G Rx paths from antenna to LNA port of RFIC. Additionally, GPS and LB/HB WiFi coexistence are designed-in for exceptional support to maintain all radio performance, even in user scenarios of simultaneous use. Optimized low insertion-loss Rx paths, matching circuits, and well-grounded guard traces (high Tx–Rx isolation) inside the module mitigate de-sense problems and enhance sensitivity performance.

**TRx and RX Ports:** The SKY78027-12 provides eight auxiliary ports.

**Ordering Information**

Product Name	Order Number	Evaluation Board Part Number
SKY78027-12 SkyOne™ multimode multiband front-end module	SKY78027-12	EN40-D706-001

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