

PRODUCT SUMMARY

SKY77597-11 Tx-Rx FEM for Quad-Band GSM/GPRS/EDGE, and Dual-Band TD-SCDMA w/ Six Linear TRx Switch Ports, and High Band Power Amplifier Output for SVLTE Applications w/ SP2T Switch

Applications

- Quad-band GSM/EDGE and Dual-Band TD-SCDMA cellular handsets encompassing
 - Class 4 GSM850/900
 - Class 1 DCS1800/PCS1900
 - Class 12 GPRS multi-slot operation
 - Six low insertion loss/high linearity interchangeable TRx switch ports
 - Linear EDGE operation
 - TD-SCDMA Bands 34/39

Features

- Small, low profile package
 - 6 mm x 6 mm x 0.9 mm
 - 28-pad configuration
- Low input power range 0 dBm to 6 dBm
- High efficiency
- Tx-VCO-to-antenna and antenna-to-Rx-SAW filter RF interface
- Tx harmonics below -40 dBm
- Current limiting for over-voltage protection and extended battery life
- I/O matched internally to 50 Ω
- High impedance control inputs: 20 μA, maximum
- Power control circuitry built-in for improved TRP variation

Description

SKY77597-11 is a transmit and receive Front End Module (FEM) designed in a very low profile (0.9 mm) and compact form factor for quad-band cellular handsets comprising GSM850/900, DCS1800/PCS1900 operation and dual-band TD-SCDMA bands 34 and 39 operation—a complete transmit VCO-to-Antenna and Antenna-to-receive SAW filter solution. The FEM also supports Class 12 General Packet Radio Service (GPRS) multi-slot operation and linear EDGE operation. 3G switch-through support is provided by six dedicated high-linearity ports. High band Tx (DCS1800) is brought out to a module pad through an integrated SP2T switch for SVLTE applications.

The module consists of a GSM850/900 PA and DCS1800/PCS1900/TD-SCDMA PA block, impedance-matching circuitry for 50 Ω input and output impedances, Tx harmonic filtering, a high linearity/low insertion loss switch, and a CMOS Power Amplifier Control (PAC) block. A custom silicon integrated circuit contains decoder circuitry to control the RF switch while providing a low current, external control interface.

Fabricated in GaAs, the Heterojunction Bipolar Transistor (HBT) PA blocks support the GSM850/900 bands and DCS1800/PCS1900 bands and TD-SCDMA bands 34/39. Both PA blocks share common power supply pads to distribute current. The output of the PA block and the outputs to the six receive pads connect to the antenna pad through a high-linearity antenna switch. The 3G and Rx ports feature a 0 V DC offset level which eliminates the need for external blocking capacitors. The GaAs die, switch die, CMOS controller die, and passive components are mounted on a multi-layer laminate substrate and the entire assembly is encapsulated with plastic overmold.

RF input and output ports of the SKY77597-11 are internally matched to a 50 Ω load to reduce the number of external components on the phone board. Extremely low leakage current of the FEM maximizes handset standby time. Control of transmit and receive RF signal flows, and band selection are performed by four external control pads (see Figure 1 on overleaf). Mode of operation, Tx vs. Rx, and Band (GSM850, GSM900, DCS1800, PCS1900, and Bands 34/39) are controlled with the four logic inputs: Mode, TxEN, BS1, and BS2. Proper timing of the TxEN input and the VRAMP input ensures high isolation between the antenna and Tx-VCO while the VCO is being tuned prior to the transmit burst.

The integrated power amplifier control (PAC) function provides envelope amplitude control while reducing sensitivity to input drive, temperature, power supply, and process variation. Output power variation into mismatch is minimized with Skyworks' Finger-Based Integrated Power Amplifier Control (FB-iPAC) control circuit.



Skyworks Green™ products are compliant with all applicable legislation and are halogen-free. For additional information, refer to Skyworks *Definition of Green™*, document number SQ04-0074.

Ordering Information

Product Name	Order Number	Evaluation Board Part Number
SKY77597-11 Tx-Rx Front-End Module	SKY77597-11	EN40-D795-001

Copyright © 2014, Skyworks Solutions, Inc. All Rights Reserved.

Information in this document is provided in connection with Skyworks Solutions, Inc. ("Skyworks") products or services. These materials, including the information contained herein, are provided by Skyworks as a service to its customers and may be used for informational purposes only by the customer. Skyworks assumes no responsibility for errors or omissions in these materials or the information contained herein. Skyworks may change its documentation, products, services, specifications or product descriptions at any time, without notice. Skyworks makes no commitment to update the materials or information and shall have no responsibility whatsoever for conflicts, incompatibilities, or other difficulties arising from any future changes.

No license, whether express, implied, by estoppel or otherwise, is granted to any intellectual property rights by this document. Skyworks assumes no liability for any materials, products or information provided hereunder, including the sale, distribution, reproduction or use of Skyworks products, information or materials, except as may be provided in Skyworks Terms and Conditions of Sale.

THE MATERIALS, PRODUCTS AND INFORMATION ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE, INCLUDING FITNESS FOR A PARTICULAR PURPOSE OR USE, MERCHANTABILITY, PERFORMANCE, QUALITY OR NON-INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHT; ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED. SKYWORKS DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. SKYWORKS SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO ANY SPECIAL, INDIRECT, INCIDENTAL, STATUTORY, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS THAT MAY RESULT FROM THE USE OF THE MATERIALS OR INFORMATION, WHETHER OR NOT THE RECIPIENT OF MATERIALS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Skyworks products are not intended for use in medical, lifesaving or life-sustaining applications, or other equipment in which the failure of the Skyworks products could lead to personal injury, death, physical or environmental damage. Skyworks customers using or selling Skyworks products for use in such applications do so at their own risk and agree to fully indemnify Skyworks for any damages resulting from such improper use or sale.

Customers are responsible for their products and applications using Skyworks products, which may deviate from published specifications as a result of design defects, errors, or operation of products outside of published parameters or design specifications. Customers should include design and operating safeguards to minimize these and other risks. Skyworks assumes no liability for applications assistance, customer product design, or damage to any equipment resulting from the use of Skyworks products outside of stated published specifications or parameters.

Skyworks and the Skyworks symbol are trademarks or registered trademarks of Skyworks Solutions, Inc., in the United States and other countries. Third-party brands and names are for identification purposes only, and are the property of their respective owners. Additional information, including relevant terms and conditions, posted at www.skyworksinc.com, are incorporated by reference.