



GRF6501 PHS Transceiver

GRF6501 FEATURES

- ❑ True single chip CMOS RF transceiver
 - ✓ Integrated LNA fully covering international 1.9GHz PHS band
 - ✓ Fully integrated transmitter with programmable output power
 - ✓ Built-in channel selection filter
 - ✓ Fully integrated sigma-delta fractional-N frequency synthesizer including VCO and loop filters
 - ✓ Built-in DCXO
- ❑ Low-cost CMOS process technology with high performance
 - ✓ Allow under -105dBm minimum
 - ✓ NF ~ 4dB, IIP3 ~ -15.5 dBm (typ.)
- ❑ CMOS LIF Direct Conversion enabling low-cost RF sub-system
 - ✓ Minimized external RF components
 - ✓ No external IF components
 - ✓ Interface to UT8860
- ❑ Small form factor
 - ✓ 40pin 6 mm X 6 mm QFN
- ❑ Low power consumption
 - ✓ Rx : 78mA, Tx : 45mA (typ.)
- ❑ Fast switching time
 - ✓ Support seamless handover
 - ✓ Less than 22 us switching time: Channel switching, Tx/Rx switching
- ❑ High performance Ultra fast-lock PLL
 - ✓ Phase noise: -118dBc/Hz at 600kHz offset (typ.)
 - ✓ Lock time < 20 us
- ❑ Analog base-band interface
 - ✓ Tx: Zero IF I/Q
 - ✓ Rx: 150kHz Low IF I/Q
 - ✓ 3-wire program interface
- ❑ Supply voltage from 2.7V to 3.0V
- ❑ Fully programmable gain stages
 - ✓ Wide dynamic range: 86 dB range
 - ✓ Precise gain control: 2 dB gain
- ❑ PHS V4.0 compliant

SUMMARY OF BENEFITS

- ❑ Most cost effective PHS RF Transceiver
 - ✓ TRUE "single chip" transceiver
 - ✓ Lowest BOM count < 40 components
 - ✓ Precise built-in DCXO which replaces expensive VCTCXO with regular low-cost crystal
- ❑ Extend the Frequency bands to support many nations
 - ✓ Covers Japan, China, India, Mexico, and Vietnam
- ❑ Outstanding performance per cost
 - ✓ Providing good sensitivity performance for mobile applications
 - ✓ Providing considerable RF performance margins for mobile applications
 - ✓ Longer battery life
- ❑ Easy design and interface

GENERAL DESCRIPTION

GRF6501 is a highly integrated monolithic RF transceiver for PHS applications based on GCT's industry proven CMOS RF technologies. It employs GCT's intrinsic low-IF (intermediate frequency) radio technology and requires a minimum number of external components resulting to lower BOM cost and smaller PCB area. It is housed in 40-pin 6mmx6mm QFN package.

GRF6501 consists of receiver, transmitter, and PLL. The receiver section includes all functional blocks from the RF front-end to the base-band interface; LNA for 1.9GHz bands, down-conversion mixers, base-band filters, gain-controlled amplifiers and analog I/Q interface suited for low-IF interface.

The transmit section uses I/Q up-conversion architecture including analog base-band I/Q interface, up-conversion mixers and preamplifiers.

The on-chip PLL includes VCO, a sigma-delta fractional-N frequency synthesizer, and built-in loop filters meeting fast and stable switching time requirements. The digitally controlled crystal oscillator (DCXO) function can provide reference clock instead of TCVCXO.

Simplified Application Block Diagram

