DATA SHEET

UAA3558
Bluetooth RF Transceiver

Objective specification
File under Integrated Circuits, IC17

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Bluetooth RF Transceiver UAA3558

FEATURES

- Low cost solution for a Bluetooth radio
- Fully integrated receiver with high sensitivity
- Integrated low phase noise VCO
- Dedicated Bluetooth Phase-Locked Loop (PLL) synthesizer
- 4 dBm programmable transmitter preamplifier with an integrated switch
- 3-line serial interface bus
- Low current consumption from 3.0 V supply.

APPLICATIONS

2400 to 2497 MHz Bluetooth radio transmission and reception in the Industrial Scientific and Medical (ISM) band.

GENERAL DESCRIPTION

The UAA3558 BiCMOS device is a low power, highly integrated circuit. It features a fully integrated receiver, from antenna filter output to the demodulated data output, an integrated VCO, a synthesizer to implement Bluetooth channel frequencies, and a transmitter preamplifier to drive either the switch diode to antenna or a power amplifier.

The synthesizer's main divider is driven by the prescaler output in the range of 2400 to 2497 MHz and programmed via a 3-wire serial bus. The reference divider ratio can be programmed to 12, 13, 16 or 26. Outputs of the main and reference dividers drive a phase comparator, where a charge pump produces phase error current pulses for integration in an external loop filter. The charge-pump current (phase comparator gain) is set to 3.5 mA.

The synthesizer is programmed and switches on 200 µs before the desired slot to lock the VCO to the required channel frequency. Just before the desired slot, the synthesizer is switched off, allowing open loop modulation of the VCO during transmission.

The device is designed to operate from 3.0 V nominal supplies. Separate power and ground pins are provided to the different parts of the circuit. The ground leads should be connected together externally to prevent large currents flowing across the IC, which would cause damage. All V_{CC} pins must also be at the same potential (V_{CC}).

QUICK REFERENCE DATA

V_{CC} = 3.0 V; T_{amb} = 25 °C; characteristics for which only a typical value is given are not tested; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
V_{CC}	supply voltage		2.8	3.0	3.6	V
$I_{CC(GUARD-RX)}$	receiver supply current	during RX guard space	–	25	tbf	mA
$I_{CC(RX)}$	receiver supply current	during RX (open loop PLL)	–	60	tbf	mA
$I_{CC(GUARD-TX)}$	transmitter supply current	during TX guard space	–	36	tbf	mA
$I_{CC(TX)}$	transmitter supply current	during TX	–	30	tbf	mA
$I_{CC(pd)}$	total supply current in Power-down mode		–	10	60	µA
$f_{o(RF)}$	RF output frequency		2400	–	2497	MHz
f_{xtal}	crystal reference input frequency		12	–	26	MHz
f_{PC}	phase comparator frequency		–	1	–	MHz
T_{amb}	ambient temperature		–10	–	+50	°C

ORDERING INFORMATION

TYPE NUMBER	PACKAGE		
	NAME	DESCRIPTION	VERSION
UAA3558HL	LQFP32	plastic low profile quad flat package; 32 leads; body 5 × 5 × 1.4 mm	SOT401-1
UAA3558HN	HVQFN32	plastic, heatsink very thin quad flat package; no leads; 32 terminals; body 5 × 5 × 0.85 mm	SOT617-1

BLOCK DIAGRAM

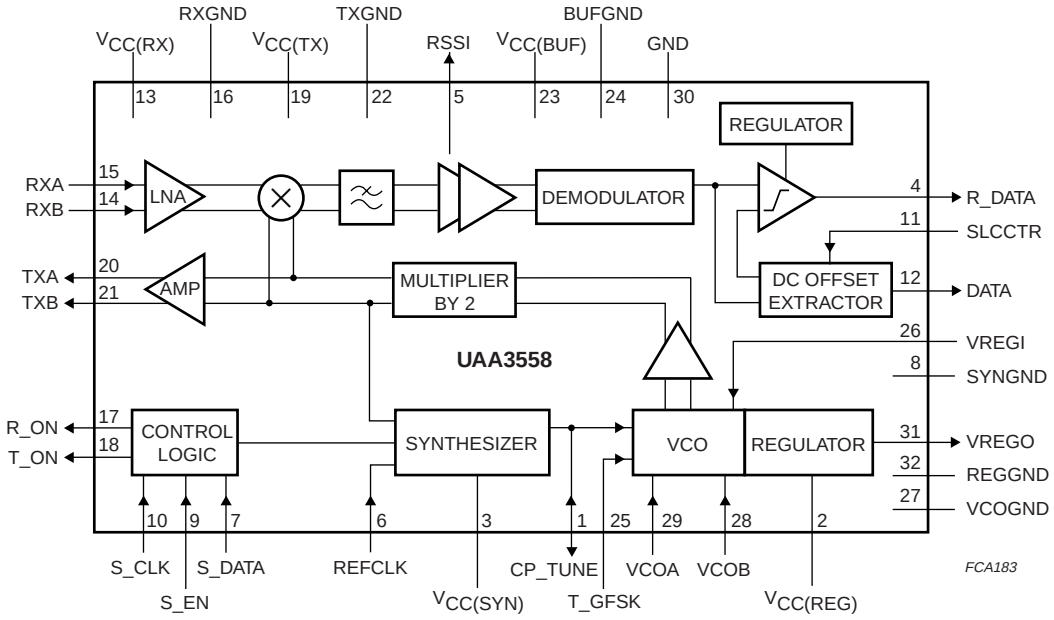

Fig.1 Block diagram.

DATA SHEET STATUS

DATA SHEET STATUS	PRODUCT STATUS	DEFINITIONS (1)
Objective specification	Development	This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.
Preliminary specification	Qualification	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Product specification	Production	This data sheet contains final specifications. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.

Note

1. Please consult the most recently issued data sheet before initiating or completing a design.

DEFINITIONS

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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