

GSM RF Transceiver

Description

The U2876B is a bipolar integrated RF transceiver for GSM based cellular systems (900/1800/1900 MHz) and other wireless communication products. The total solution consists of a **Direct Conversion Receiver (DCR)** and an offset-loop transmitter architecture.

The receiver incorporates the low-noise amplifier (LNA), a direct conversion quadrature demodulator, the baseband filtering and an AGC amplifier for the I/Q signals. The transmitter consists of an I/Q modulator, a phase

comparator, the VCO driver and a down converter. The device also includes the 3-wire bus interface and on-chip offset control. The U2876B can form a small size transceiver by adding a double PLL frequency synthesizer, a power amplifier (e. g. TST0911) and few external components.

With the **Direct Conversion Receiver** concept TEMIC Semiconductors offers the most competitive and innovative RF platform for dual- or triple band operation.

Features

- Lowest system cost (bill of material)
- Highest level of system integration
- One device for all GSM bands (900/1800/1900 MHz)
- Supply voltage range 2.7 V to 5.5 V
- Current consumption @ $V_s = 3\text{ V}$
RX mode: 33.0 mA,
TX mode: 38.0 mA
Idle mode: < 1.0 mA
- Direct Conversion Receiver (DCR) architecture eliminates the second RF Image filter, IF LO, IF mixer and IF SAW filter
- 500 MHz to 2000 MHz RF-input frequency range
- More than 95 dB AGC control range
- Noise figure 3.8 dB
- Automatic baseband offset correction, residual offset correction via the baseband processor with minimum 10-bit resolution and special correction algorithm
- Only one local oscillator, single PLL
- Modulation loop transmitter reduces TX spurious and noise with the result of reduced filter costs and improved batterie lifetime
- 3-wire bus control for AGC and band selection, easy interface to baseband IC
- 64-pin Thin Quad Flat Package (TQFP64)

Block Diagram

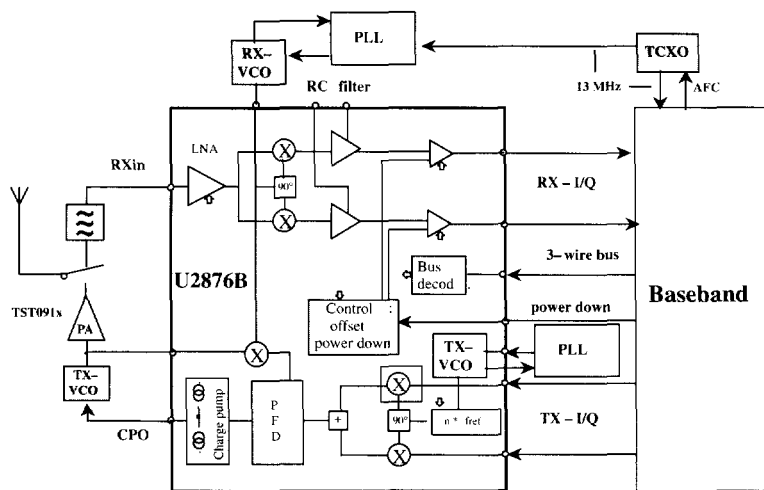


Figure 1. Block diagram

Ordering Information

Extended Type Number	Package	Remarks
U2876B-MFZ	TQFP64	Tray
U2876B-MFZG3	TQFP64	Taped and reeled

Detailed Block Diagram

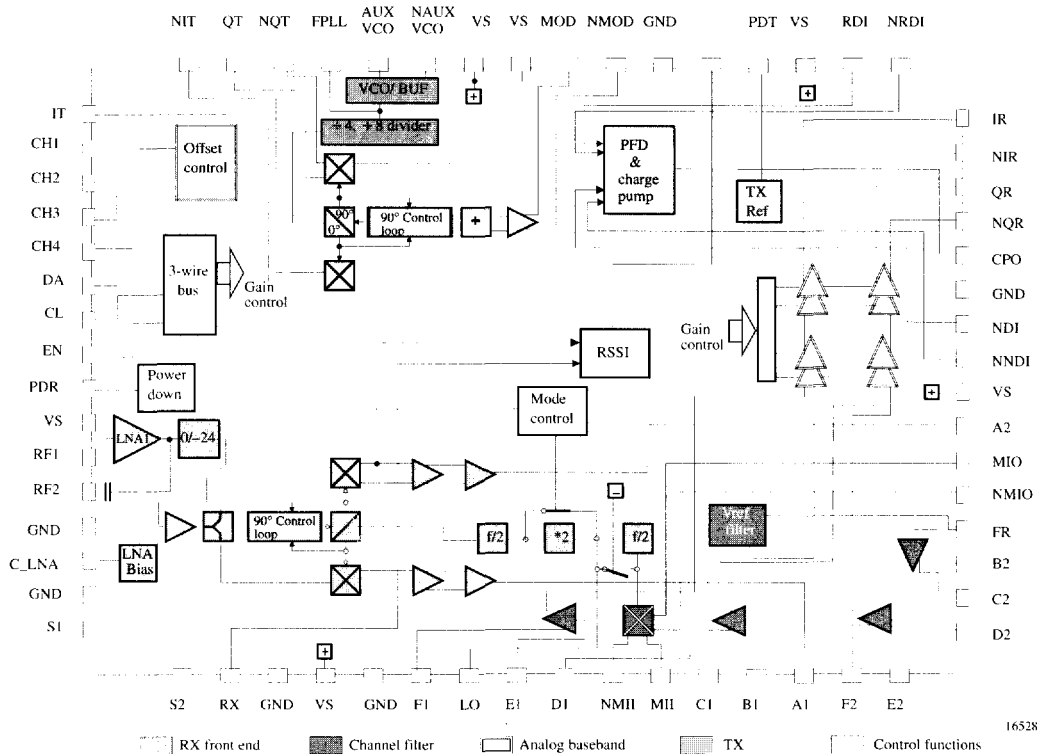


Figure 2. Detailed block diagram

Pin Description

Pin	Symbol	Function
1	QT	Q input Tx I/Q modulator
2	NQT	Q input Tx I/Q modulator
3	GND	Ground
4	NAUX_VCO	Tank circuit aux. VCO
5	AUX_VCO	Tank circuit aux. VCO
6	FPLL	Aux. VCO output
7	DA	DATA 3-wire bus
8	CL	CLOCK 3-wire bus
9	EN	ENABLE 31-wire bus
10	VS	Supply voltage 3 V
11	PDR	Power down Rx
12	PDT	Power down Tx
13	RF1	Input LNA1
14	GND	Ground
15	C_LNA	Bias external LNA
16	GND	Ground
17	RF2	Input LNA2
18	RX	RSSI sensitivity control
19	TO	Output offset trigger
20	GND	Ground
21	VS	Supply voltage 3 V
22	A2	Ext. R,C for Q-ch. baseband filter
23	B2	Ext. R,C for Q-ch. baseband filter
24	C2	Ext. R,C for Q-ch. baseband filter
25	D1	Ext. R,C for I-ch. baseband filter
26	E1	Ext. R,C for I-ch. baseband filter
27	D2	Ext. R,C for Q-ch. baseband filter
28	E2	Ext. R,C for Q-ch. baseband filter
29	F2	Ext. R,C for Q-ch. baseband filter
30	A1	Ext. R,C for I-ch. baseband filter
31	B1	Ext. R,C for I-ch. baseband filter

Pin	Symbol	Function
32	C1	Ext. R,C for I-ch. baseband filter
33	MIO	Output down converter
34	NMIO	Inv. output down converter
35	FR	Filter reference
36	LO	Local oscillator Rx
37	MII	Input Tx down converter
38	NMII	Inv. input Tx down converter
39	F1	Ext. R,C for I ch. baseband filter
40	VS	Supply voltage 3 V
41	CPO	Charge pump output
42	GND	Ground
43	CH2	Hold capacitor offset servo
44	CH4	Hold capacitor offset servo
45	NNDI	Inv. N input phase frequency detector
46	NDI	N input phase frequency detector
47	QR	Q output baseband
48	NQR	Inv. Q output baseband
49	NIR	Inv. I output baseband
50	IR	I output baseband
51	NRDI	Inv. R input phase frequency detector
52	RDI	R input phase frequency detector
53	VS	Supply voltage 3 V
54	CH3	Hold capacitor offset servo
55	CH1	Hold capacitor offset servo
56	GND	Ground
57	S1	I offset alt. compensation
58	S2	Q offset alt. compensation
59	VS	Supply voltage 3 V
60	NMDO	Inv. output TX I/Q modulator
61	MDO	Output TX I/Q modulator
62	VS	Supply voltage 3 V
63	IT	I input TX I/Q modulator
64	NIT	Inv. I input TX I/Q modulator

Package Information

Package TQFP 64

Dimensions in mm

