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General Description

The transmission frequency f_0 at the differential inputs LO, LOX is first doubled and then filtered in such a way that a sine wave arises at $2f_0$ about 1.8 GHz.

This frequency is the clock for a 2:1 divider. At the outputs of the two latches of this divider orthogonal carriers LOA and LOB for the modulator are produced.

The modulator consists of two Gilbert Multipliers which are operated in switching mode by LOA and LOB respectively. Furthermore these multipliers are driven with high linearity by the modulation signal $A(t)$ and $B(t)$ up to 1Vpp.

The outputs of both Gilbert cells are combined at the addition points. The sum drives a linear output stage.

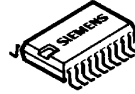
An internal current source resistor of the output stage is fed to POW. This pad is to be connected to GND when minimal nonlinear distortion is wanted. Otherwise a resistor is to be inserted, e. g. 30Ω to reduce the output current.

The pads PP, PPX and P, PX and VSI are used for DC-testing. EN is the power-down switch.

The phase $\omega_0 t + \psi(t)$ of RF-carriers about 900 MHz is modulated by external signal $S A(t) = K_1 \sin \psi(t)$ and $B(t) = K_1 \cos \psi(t)$. The circuit is to be incorporated into a transmitter for mobile telephones conforming to the GSM standards.

Application

- continuous phase modulation, e. g. GMSK
- digital mobile radio
- GSM-systems
- frequency fine tuning

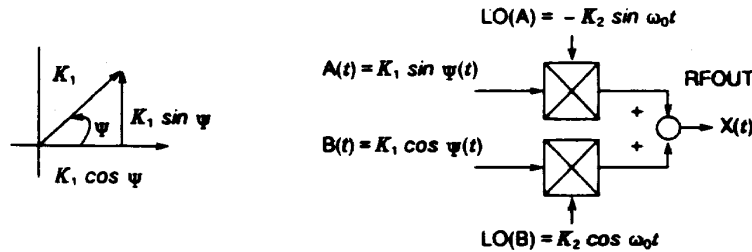


P-DSO-20

| Type | Package |
|----------|----------------|
| PMB 2200 | P-DSO-20 (SMD) |

Features

- Double-balanced mixer
- Direct modulation
- Linear modulating inputs
- Symmetrical circuitry
- Generation of orthogonal carriers without external elements
- No trimming required
- 35dB carrier rejection, 40dB SSB rejection
- 42 dB rejection of third order products at normal drive level
- 38dB rejection of doubled RF output frequency
- 0dBm output power
- power ON/OFF switch, low standby current
- LO frequency range 800 MHz to 1000 MHz
- Modulation frequency range 0 to 400 MHz
- Temperature range -25°C to 85°C

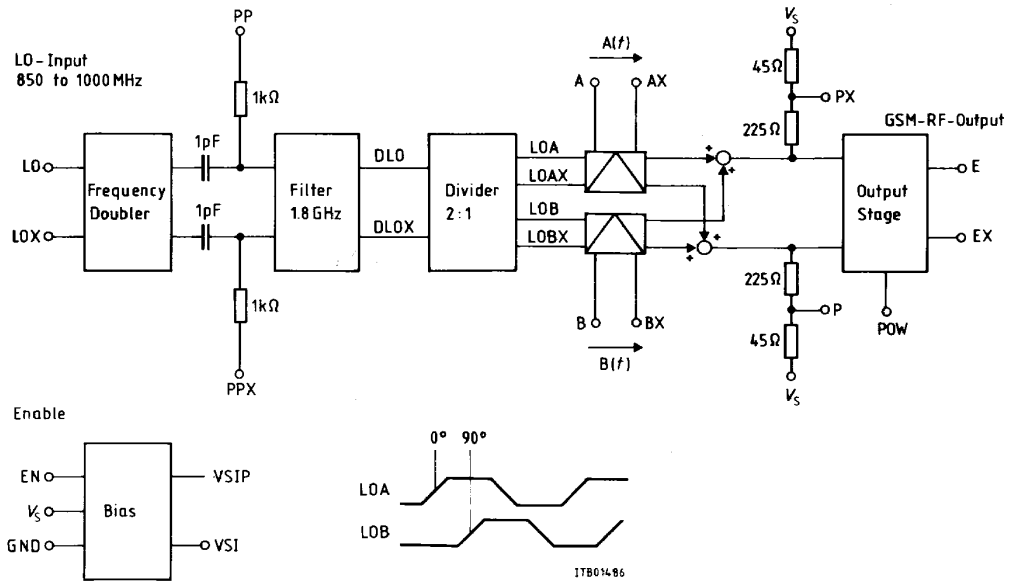


$$X(t) = K_1 \cos \psi(t) \times K_2 \cos \omega_0 t - K_1 \sin \psi(t) \times K_2 \sin \omega_0 t = K_1 K_2 \cos(\omega_0 t + \psi(t))$$

Realisation to eq. (8) in GSM rec. 05.04. Feb. 88.

The actual internal generated orthogonal LO carriers work in switching mode.

Block Diagram



Application Circuit

