# 22.4 to 44.8 MHz 4th order low pass filter

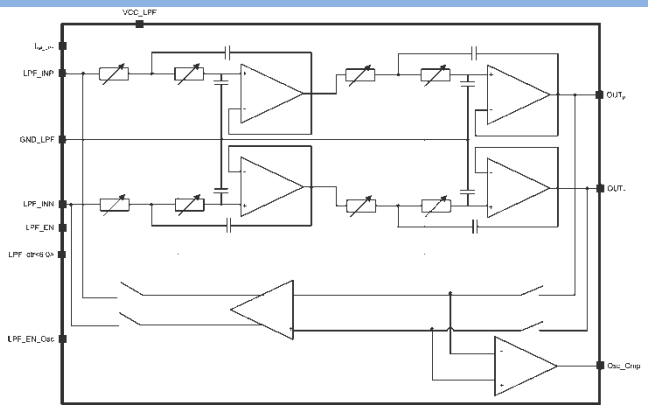
## OVERVIEW

Low-pass filter (LPF) is the 4th order Butterworth filter with cut-off frequency adjustment. There are two modes for cut-off frequency programming: manually or automatically. In automatic mode one of the circuits is used in an oscillator mode therewith the oscillation frequency correlates with the LPF frequency. High third-order input intercept point is reached due to using a pseudodifferential circuit and Sallen-Key circuit.

IP technology: AMS SiGe BiCMOS 0.35um.

IP status: silicon proven.

Area: 0.6 mm$^2$




## ELECTRICAL CHARACTERISTICS

| Parameter | Symbol | Condition | Value | | | Unit |
|---|---|---|---|---|---|---|
| | | | min | typ. | max | |
| Supply voltage | $V_{cc}$ | - | 2.7 | 3 | 3.3 | V |
| Operating temperature range | T | - | -40 | 27 | +85 | ºC |
| Cut-off frequency | F | -1 dB | 18.7 | 26.5 | 37.2 | MHz |
| | | -3 dB | 22.4 | 31.9 | 44.8 | |
| Loss | L | Octave | 17 | 18.9 | 24 | dB |
| Group delay time ripple | $t_{del}$ | Range from 2.5 to 18.2 MHz | - | 3.5 | 8.4 | ns |
| | | Range from 4.5 to 22.5 MHz | - | 4.8 | 8.6 | |
| Noise figure | NF | $R_{IN}$ = 100 Ohm | - | 23.8 | 27.2 | dB |
| Transmission gain | G | - | -0.5 | 0.3 | 0.9 | dB |
| Input compression point | $IP_{1dB}$ | $R_{IN}$ = 100 Ohm | 2.2 | 5.5 | - | dBm |
| Supply current | $I_{cc}$ | - | - | 3.49 | 3.52 | mA |
| Input logic-high level | $V_{IH}$ | For digital inputs | $0.9V_{cc}$ | - | $V_{cc}$ | V |
| Input logic-low level | $V_{IL}$ | | -0.2 | 0 | 0.2 | V |