R1-14

$\Sigma\Delta$-Modulator with High Nearby Interferers Suppression by Transmission Zeroes
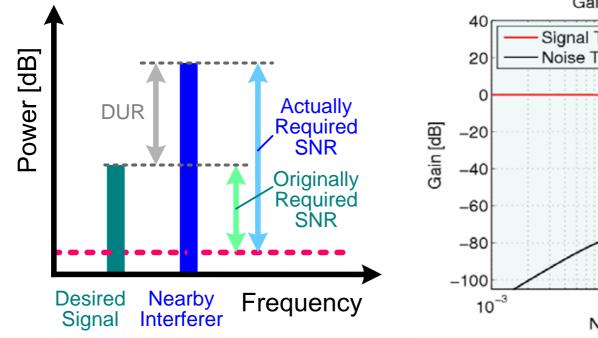
Takashi Moue, Akira Matsuzawa
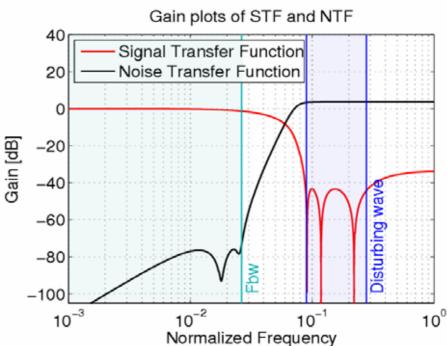
Tokyo Institute of Technology

◆ Back Ground

- ◆ In receivers of some wireless standards, higher resolution (and DR) ADC is required because of large nearby interferer.
- ◆ Large interferer also causes serious instability.

◆ Proposed $\Sigma\Delta$-Modulator

- ◆ Notched Signal-Transfer-Function realized by feedforward signal passes suppresses nearby interferers.
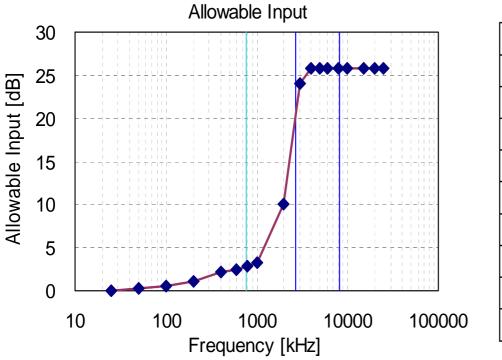- ◆ Equivalent SQNR (and DR) for nearby interferer is increased.

◆Influence of Noise

◆In thermal noise dominated $\Sigma\Delta$-modulator, the effect of DR increase is lowered because of limited input signal amplitude and noise.

◆Implementation

◆A 777kHz-BW DT 6th-order $\Sigma\Delta$-modulator has been Implemented in 0.18um CMOS technology.

◆More than 20 dB suppression of nearby interferers have been measured.

Allowable Input

Input Sampling Frequency	59.0625 MHz
Band Width	777 kHz
Interferer Frequency Range	2.65 MHz - 8.22 MHz
Interferer Suppression	20 dB+
Supply Voltage	1.8 V
CMOS Process	0.18 μm
Peak SNR (Designed)	70 dB+
Peak SNR (Measured)	59 dB
Power Consumption	45.5 mW
Core Size	0.94 mm^2