



The Silicon Optix gm2242BB IC is a half-band decimating/ interpolating linear phase digital filter that is suitable for applications requiring pre-filtering or post-filtering of digital video signals.

The gm2242BB can perform decimation by 2, interpolation by 2, equal-rate and pass-through filtering. An optional $\sin x/x$ filter is available and may be enabled in any mode. The output data format is selectable between unsigned, two's complement, and inverted offset.

An advanced 12-bit fixed coefficient Finite Impulse Response (FIR) filter is incorporated into the gm2242BB. This linear phase FIR filter may be used by itself or in conjunction with the $\sin x/x$ filter in any operating mode.

The output data rate is 0.5, 1 or 2 times the input sample rate, up to a maximum throughput of 60 MHz. The data latency or digital group delay remains constant at 34 clock cycles, regardless of the operating mode. NTSC, PAL, SECAM and square pixel video standards are all supported.

The filter's stopband attenuation is greater than 56dB from $0.3 \times f_s$ to the Nyquist frequency and the response is 6 dB down at $0.25 \times f_s$.

APPLICATIONS:

- Analog-to-Digital Post-Filtering
- Digital-to-Analog Pre-filtering
- 2:1 Decimation
- 1:2 Interpolation
- Digital Low-Pass Filtering Requiring
 - Passband Below $0.20 \times f_s$
 - Stopband Above $0.30 \times f_s$

FEATURES

COMPATIBILITY

Monolithic Half-Band Digital Filter

TRW/Raytheon/Fairchild TMC2242 pin – compatible with enhancements

44-pin PLCC or 44-pin QFP 10 x 10 mm Package

HIGH QUALITY PRE/POST FILTERING

Low Passband Ripple < 0.014 dB allows for better results from applications requiring continual cascading

Low Overshoot < 6.7%

High Stopband Attenuation > 56 dB

True Unity Gain at DC

Selectable $\sin x/x$ Compensating Filter: Minimizes aperture distortion during D/A conversion

FLEXIBLE OPERATION

Five Modes of Operation

- Interpolation by 2 (0 dB gain)
- Interpolation by 2 (-6 dB gain)
- Decimation by 2
- Equal-rate Filtering
- Pass-through (No Filtering)
- Data Latency of 34 Clock Cycles in All Modes

Up to 60 MHz Operation

FLEXIBLE INPUT & OUTPUT FORMATS

Input Formats: 12 bit unsigned data or 12 bit signed data (Two's complement)

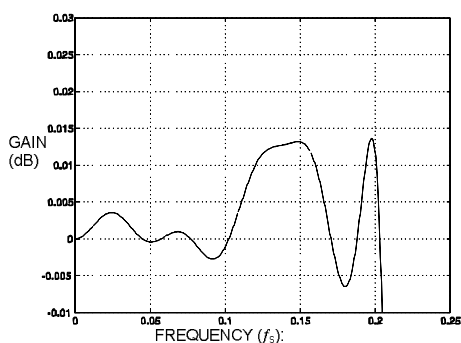
Output Formats Unsigned data, signed data (Two's Complement) or inverted offset binary data

Output Rounding: Selectable 8 to 16-bit output with optional CCIR 601 8/10 bit range clamping

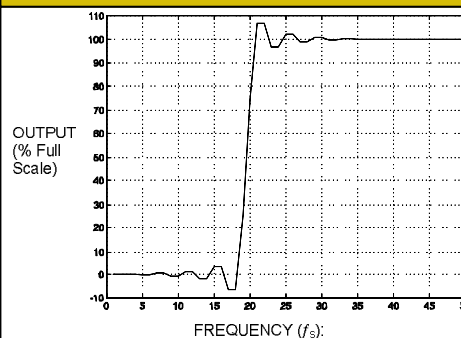


FREQUENCY RESPONSES

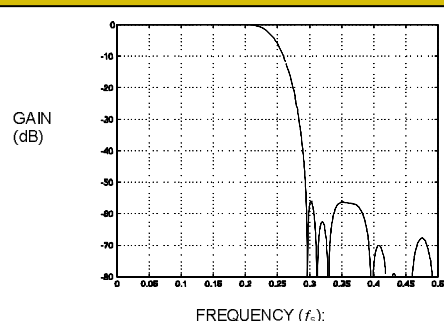
Half-Band Filter Passband Frequency



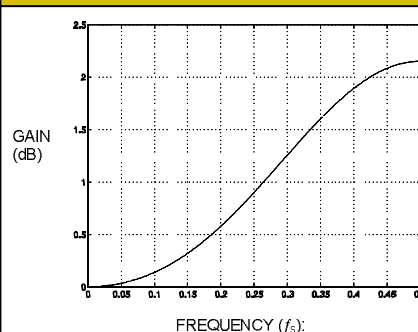
Half-Band Filter Step Response



Half-Band Filter Frequency Response



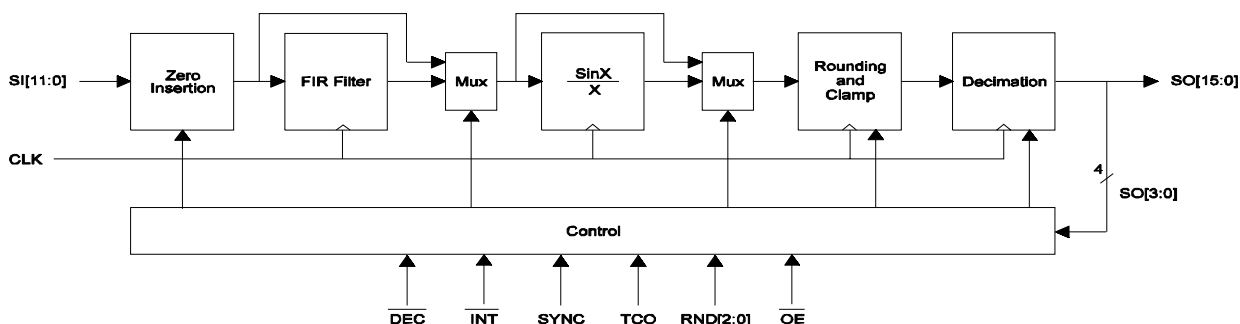
Sinx/x Frequency Response



ORDER INFORMATION

Order Code	Temp.	Package	Maximum Speed	Package Marking
gm2242BB CJ2	Commercial 0°C - 70°C	44-pin PLCC	60MHz	BA-J2/ gm2242BB
gm2242BB CQ2	Commercial 0°C - 70°C	44-pin QFP	60MHz	BA0-Q2/ gm2242BB

gm2242BB BLOCK DIAGRAM



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