## Coefficient Calculations

### Peak Filter Setting

With fS as the input signal sampling frequency, fC as the required peak filter center frequency, BW as the bandwidth, and G (dB) as the gain, use the following steps for coefficient calculation:

1. Transfer the gain in decibels (dB) to decimal domain.



1. Calculate the double precision coefficients.















1. Transfer the double precision coefficients to integer values represented by registers.

*p0* = *round*(*p0* × 2^23)  
*p1* = *round*(*p1* × 2^23)  
*p2* = *round*(*p2* × 2^23)  
*d1* = *round*(*d1* × 2^23)  
*d2* = *round*(*d2* × 2^23)

1. Transfer the decimal integer values to 26-bit, twos complement hex values.

### Low-Pass Shelving Filter

The low-pass shelving filter transfer function is



With fS as the input signal sampling frequency, fC as the required peak filter center frequency, and G (dB) as the gain, use the following steps for coefficient calculation:

1. Transfer the gain in decibels (dB) to decimal domain.



1. Calculate the double precision coefficients.









1. Transfer the double precision coefficients to integer values represented by registers.

*p0* = *round*(*p0* × 2^23)  
*p1* = *round*(*p1* × 2^23)  
*d1* = *round*(*d1* × 2^23)

1. Transfer the decimal integer values to 26-bit twos complement hex values.

### High-Pass Shelving Filter

The high-pass shelving filter transfer function is



With fS as the input signal sampling frequency, fC as the required peak filter center frequency, and G (dB) as the gain, use the following steps for coefficient calculation:

1. Transfer the gain in decibels (dB) to decimal domain.



1. Calculate the double precision coefficients.









1. Transfer the double precision coefficients to integer values represented by registers.

*p0* = *round*(*p0* × 2^23)

*p1* = *round*(*p1* × 2^23)

*d1* = *round*(*d1* × 2^23)

1. Transfer the decimal integer values to 26-bit twos complement hexadecimal values.