##### SRRC Filtered Offset-QPSK

Two variants of SRRC Offset-QPSK are described below. Square root raised cosine baseband filtered OQPSK can be formed by filtering rectangular NRZ pulses with a SRRC filter, similar to the Butterworth filtered OQPSK described in 3.2.2.3.1. A different form of SRRC OQPSK is created by using the impulse response of the SRRC filter as the signaling pulse shape. This type of SRRC OQPSK, described in 3.2.2.3.2.2, satisfies the Nyquist criterion for ISI-free signaling and is referred to as Nyquist pulse-shaped SRRC OQPSK in this Green Book to differentiate it from SRRC filtering of rectangular pulses.

###### 3.2.2.3.2.1 Baseband Filtered OQPSK with a Square Root Raised Cosine Filter

This subsection describes the SRRC filter (α = 0.5) which is one of the filter types specifically recommended for baseband filtered OQPSK. In this case the SRRC filter is used on NRZ pulses as just another filter shape, like Butterworth or Bessel, without utilizing its ISI-free property after matched filtering in exchange for a simpler implementation. The magnitude and phase response of the filter are plotted in figure 3‑25. It is to be noted that the *BTs* of the SRRC filter in this figure is chosen to be 0.5, which is twice that of the conventional (Nyquist) SRRC filter defined in Section 3.3.2.3.2.2. The simulated power spectral density for both the I/Q and PM implementations of baseband filtered OQPSK with the SRRC filter are presented in figure 3‑26. The PSD is measured at the output of a saturated power amplifier to demonstrate the ability of the spacecraft using this modulation to meet the requirements of the SFCG emissions mask. The AM/AM and AM/PM characteristics of the power amplifier are provided in annex B.



Figure 3‑25 : Magnitude and Phase Response of SRRC (α = 0.5) Filter



Figure 3‑26 : PSD for I/Q and PM Implementations of Baseband Filtered OQPSK with the Recommended SRRC Filter