

Modulating Signal Description

The transmit signal is modulated according to the 3GPP Release 5 specification for the HS-PDSCH and CPICH channels (3GPP TS 25.213). For the HS-PDSCH channel, up to 15 subchannels can carry transmit data. The data is mapped to QPSK or 16-QAM modulation symbols, with each subchannel carrying 240ksps. The modulation symbols are then spread to the 3.84Mcps chip-rate using a 16-chip Orthogonal Variable Spreading Factor code. The CPICH channel can be represented as an additional subchannel using only one point in a QPSK constellation.

All 16 subchannels (including the CPICH) are summed together and passed through a Gold Code scrambler. A root-raised cosine filter with rolloff factor $\alpha = 0.22$ is used for pulse shaping. The final result is modulated by multiplying the I component by $\cos(\omega t)$, the Q component by $-\sin(\omega t)$, and summing the results as shown.

