

| Modulation scheme              | Demodulator output SNR, (S/N)  | Observations  |
|--------------------------------|--|---|
| Baseband                       | $(S/N)_b = P_R/N_0W$   | Baseline  |
| DSB-SC AM                      | $(S/N)_{O,DSB} = (S/N)_b$  | Up/down-conversion has no effect on noise performance   |
| SSB-SC AM                      | $(S/N)_{O,SSB} = (S/N)_b$  | Single sideband has no effect on noise performance  |
| DSB-LC AM<br>(Conventional AM) | $(S/N)_{O,AM} = \eta (S/N)_b$ .<br>with $\eta = a^2 P_{mn}/(a^2 P_{mn} + 1)$ | Inserting the carrier results in a loss of $-10 \log[a^2 P_m/(a^2 P_{mn} + 1)]$ dB  |
| FM                             | $(S/N)_{O,FM} = \frac{3 \beta_f^2 P_m}{(\max\{ m(t) \})^2} (S/N)_b$          | Improvement in noise performance proportional to $\beta_f^2$ . That is, <i>the higher the bandwidth the higher the demodulator output SNR</i> |