

# Comparison of AM techniques

Technique name	Power efficiency $\eta_P = \frac{P_m}{P_c}$	Bandwidth $B$	Bandwidth efficiency $\eta_B = \frac{\text{message BW}}{B}$	Demodulator complexity
<b>DSB-SC (Double sideband)</b>	1	$2W$	$\frac{1}{2}$	Needs synchronous detector
<b>DSB-LC (Conventional AM) <math>m(t) = \cos(2\pi f_m t)</math></b>	$\frac{a^2}{2 + a^2}$	$2W$	$\frac{1}{2}$	Simple non-synchronous envelope detector
<b>SSB-SC (Single sideband)</b>	1	$W$	1	Needs synchronous detector
<b>SSB-LC <math>m(t) = \cos(2\pi f_m t)</math></b>	$\frac{a^2}{4 + a^2}$	$W$	1	Simple non-synchronous envelope detector
<b>QM-DSB (Quadrature modulation)</b>	$\frac{1}{2}$	$2W$	$\frac{1}{2}$ (Two signals in the same bandwidth)	Needs synchronous detector Two oscillators and two lowpass filters
<b>QM-SSB</b>	$\frac{1}{2}$	$W$	$\frac{2}{2}$ (Two signals in the same bandwidth)	Needs synchronous detector Two oscillators and two lowpass filters