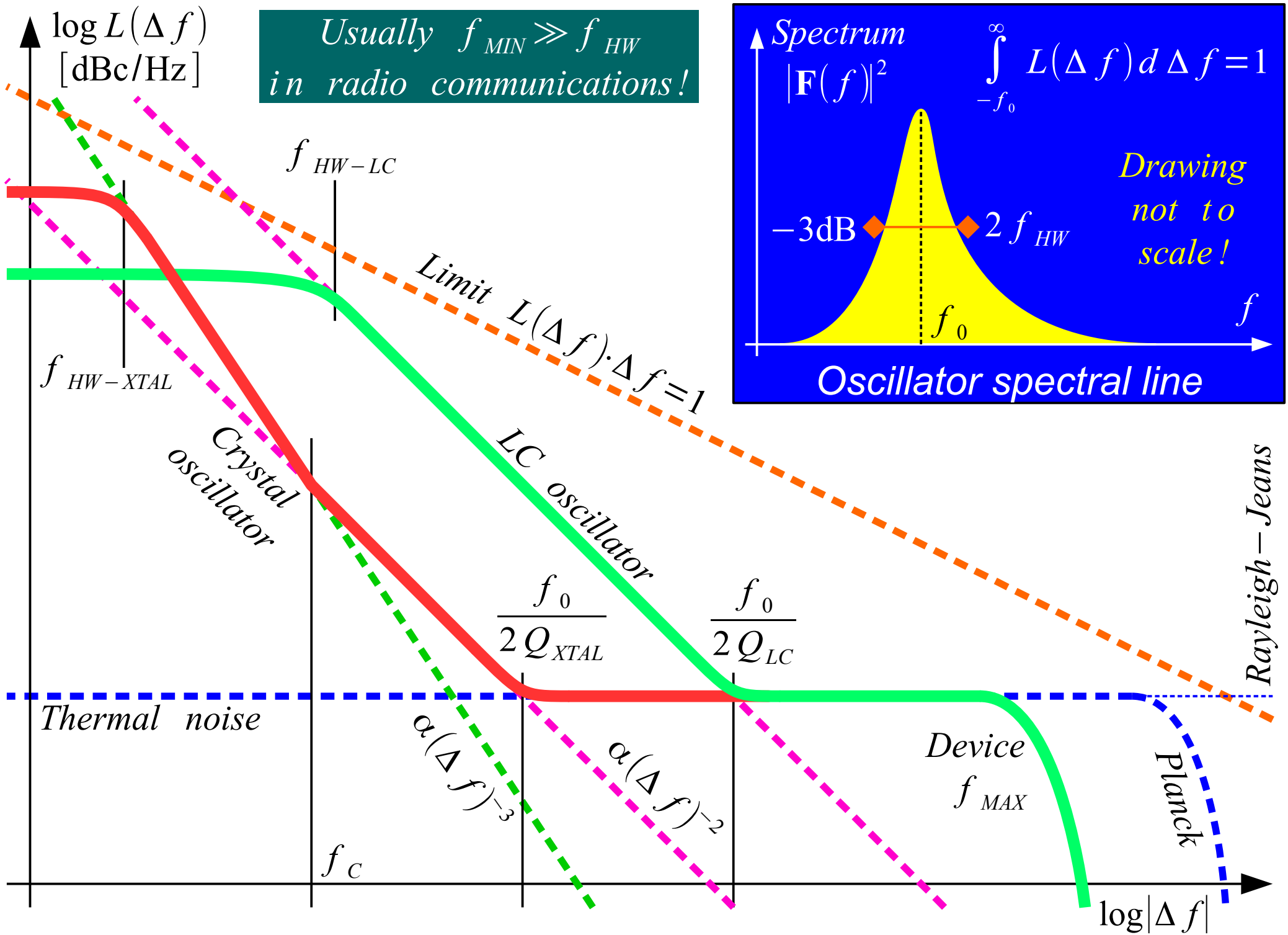
log L(Δ f) [dBc/Hz]
Usually f MIN ≫ f HW in radio communications!
f HW−LC
f HW−XTAL
Limit L(Δ f)·Δ f = 1
Crystal oscillator
LC oscillator
f 0 / 2 Q XTAL
f 0 / 2 Q LC
Thermal noise
α(Δ f)^−3
α(Δ f)^−2
Device f MAX
Planck
Rayleigh−Jeans
f C
log|Δ f|
Spectrum |F(f)|^2
∫ L(Δ f) d Δ f = 1
−3dB
2 f HW
Drawing not to scale!
f 0
f
Oscillator spectral line