No.
Date :

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4. NF = 13 dB
G = 30 dB
f_m = 15 kHz
β = 3
T_A = 500 K

a. $BW_{IF} = 2 f_m (\beta + 1) = 2 . 15\ kHz\ (3+1)$
$= 120\ kHz$

F = 13 dB = 10 dB + 3 dB = 10 × 2 = 20
$T_e = (20-1)290 = 5510\ K$

$$\left(\frac{S}{N}\right)_0 = 3\beta^3 \left(\frac{S}{N}\right)_B . P$$

$$40\ dB = 3 . 3^3 \left(\frac{S}{N}\right)_B + 6dB$$

$$10.000 = 81.4 . \left(\frac{S}{N}\right)_B$$

$$\left(\frac{S}{N}\right)_B = \frac{10000}{81.4} = 30,86 = 14,89\ dB$$

b. $$\left(\frac{S}{N}\right)_0 = 3\beta^3 \left(\frac{S}{N}\right)_B . P$$

$$40.000 = 3 . 3^3 \left(\frac{S}{N}\right)_B . 4$$

$$\left(\frac{S}{N}\right)_B = \frac{10.000}{81} = 123,456\ kali$$

$$\left(\frac{S}{N}\right)_B = \frac{S_i}{k(T_e + T_A).BW_{IF}} \rightarrow S_i = 123,456 \times 1,38 \times 10^{-23} (5510 + 500) . 120 \times 10^3$$

$$S_i = 1,23 \times 10^{-12}\ W$$