
by

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This book is now available, as of February 2010, and as expected, some errors are being found. If you find errors in this book, or have comments about this book, please send email to cp {at} doe {dot} carleton {dot} ca. A list of errors, comments, etc will be posted. If you would rather not be acknowledged on the errata list, let us know and your name will not appear. New entries since the previous major update on January 10, 2011 are highlighted in blue.

**Page xvii Preface** The location of the errata page is missing a tilde (~) in front of cp. The correct page should be: http://www.doe.carleton.ca/~cp/rfc2_errata.html  

**Page 5** To be in agreement with Figure 1.1, the second last sentence in Section 1.3 should be “A band-pass filter after the PA removes harmonics and other unwanted output components produced by the PA to prevent them from also being transmitted.”  

**Page 10** In (2.12) the second last term, in the numerator $N_i$ should be $N_{i(source)}$, and in the denominator, $S$ should be $S_i$.  

**Page 12** Near the bottom, in the determination of $v_{no(total)}$ inside the square root sign, the first term should have a subscript of $R_S + R_2$ instead of $R_2 + R_3$.  

**Page 13** The $v_{no(R_L)}$ is missing its answer (it should be fairly obvious that it is the same as for $R_3$, that is $0.45nV / \sqrt{Hz}$, but it should have been listed).  

**Page 14** Last sentence in the first paragraph, “ins” should be “in”.  

**Page 22, 23** In Table 2.1 and in Figure 2.9, for third-order intermodulation, only the terms at $2f_1 - f_2$ and $2f_2 - f_1$ have been shown since these are the components of most concern. However, it should have been stated that third-order intermodulation tones appear at $2f_1 \pm f_2$ and $2f_2 \pm f_1$.  

**Page 27** In example 2.5: the tone at 1.98GHz should be 1.99GHz  

**Page 32** Equation (2.93) should be $\frac{2\pi}{M}(i-1)$. The equation as in the text would be correct if $M$ were the number of bits, but it isn't - the number of bits is $N = \log_2(M)$, or $M = 2^N$. Also, below this equation in the example for BPSK after the comment about the phase being either 0° or 180° it should say $(i = 1$ or $2)$  

**Page 33** On second line of second paragraph: "baseband date streams"; should be: "baseband data streams"  

**Page 35** The last sentence on the page is: “The probability of symbol error for noncoherent detection ...”; should be: “The probability of bit error for noncoherent detection ...” to be consistent with equation (2.98) and Figure 2.17.
Page 37 Figure 2.19 the label of 2f_b should be 3f_b.  (rs)

Page 37 Equation (2.101) should replace N with M. Note that N = \log_2(M).  (rs)

Page 37 Fourth line of paragraph immediately after equation (2.101) is: "the spectral efficiency of FSK drops off from around 0.5 bit/sec/Hz for binary FSK and 4-FSK, to lower values as the number of bits increases." Note that for 4-FSK that the bandwidth is doubled but so is the data rate. With 8-FSK, twice as much BW is used as with 4-FSK, but the data rate only increases by 1.5, so this modulation will have a spectral efficiency of 0.375bits/sec/Hz.  (rs), (jr)

Page 39 Second line immediately after equation (2.107) “in this case 64-QAM, L =16.”; should be: "in this case 64-QAM, L = 8."  (rs)

Page 40 First sentence should read “OFDM is designed to help...” that is, remove the extra “a”  (ah)

Page 50 Equation (3.13) should have power of 2 on the second and third terms in the numerators, that is, they should be v_n^2 and v_n^3.  (ah)

Page 52 Equation (3.17): => in the second term, the first occurrence of k_a1 should be k_a2, that is, the term should be (k_a2k_b1 + k_a1^2k_b2)v_i^2  (ah)

Page 55 The intermediate result for 1/IIP3 as 2.316·10^3 is incorrect – it should be 23.16·10^3. The final answer is correct.  (gp)

Page 62 Second line from the top: => should be P_1-P_2 = ...  (ah)

Page 65 Fourth line following (3.37), the sentence should read “If we define carrier suppression C_s as the ratio of the LO leakage P_{CFT} to the desired RF power P_1 then..."  (ah)

Page 65 Third line following (3.39) The sentence should read “The EVM can then be computed as the ratio of the power of all triple beats dumping power into a channel to the power of that subcarrier.”  (ah)

Page 68 In the first line following (3.50), 2N should be 2^N.  (ah)

Page 197 Following the noise calculation in the bipolar LNA example, the quoted errors are not quite correct. The error in F should be 0.28 which is about 19% (calculated as 0.28/1.49).  (cp)

Page 199 The equation for L_G shows it is inversely related to \omega^2, but the numerical value is missing the squared sign. The final answer is correct.  (ch)

Page 208 In Figure 7.29, the y axis labels should be current from 1 nA to 100 mA.

Page 218 In Figure 7.36 both inputs are \nu_1. To be consistent with extensive continuation of this work in Chapter 8, the top input should be \nu_2 and the x axis of the current diagram should also be \nu_2. As well on the current diagram, the voltage limits should be \nu_{2mx} and \nu_{2max} and all occurrences of \nu_1 from (7.122) through (7.126) should be \nu_2. Note that later equations (7.130) through (7.132) correctly use \nu_2 for the top input. Also note that to be consistent with this CMOS differential pair and with Chapter 8, the
bipolar differential pair should also have used \( v_2 \) for the top input but at least all the equations there were locally consistent. (cp)

**Page 219** In (7.131) the exponent in the last term should be 4, not 3 i.e., this term should be \( v_2^4 \). (cp)

**Page 225** In (7.146) the middle term should be \( \frac{kT}{q} \ln \frac{I_{S2}}{I_{S1}} \). (cp)

**Page 234** in (7.154) and in Example 7.13, in three places \( C \) (capacitance) should be replaced by \( c \) (the speed of electromagnetic propagation in free space). Specifically, in (7.154) in the equation for \( L \), the denominator should be \( c \), and not \( C \). In the example, in the derivation for \( L \) and for \( C \), both equations are quoted with \( C \) in the denominator and both should be \( c \), although the correct number, that is \( 3 \times 10^8 \), is used when these are solved. Also, in the example, the equation for \( C \), in the denominator should be \( Z_0 \) (Z sub zero) and not \( Z_0 \) to match the rest of the example and (7.154). (cp)

**Page 241** Figure 8.3, \(-v_{1\text{max}}\) and \( v_{1\text{max}} \) should be \(-v_{2\text{max}}\) and \( v_{2\text{max}} \).

**Page 267** Figure 8.24, with a CMOS mixer, the resistor to the rail should be \( R_D \) instead of \( R_C \) for bipolar. Also, in the middle of the page in the calculation for \( F \), \( R_{CL} \) should be replaced with \( R_{DL} \) and in the paragraph below the equation, there is one occurrence of \( R_{CL} \) that should be replaced with \( R_{DL} \). (cp)

**Page 269** Figure 8.27 the text on the RF input curve should state 5.2 GHz and 5.1 GHz (not 5.2 GHz and 1.5 GHz). (cp)

**Page 323** in the phase noise expression (9.77), there is a missing delta symbol in front of omega in the denominator; that is, \( \omega \) should be \( \Delta \omega \). (gp)

**Page 343** Towards the bottom of the page, the equation for \( f_0 \) is missing a \( 2\pi \) in the denominator. (tr)

**Page 352** Two equations for calculating the current have come from page 321, but have been inverted, and each equation has an extra factor of \( I \) that should not be there, and the second equation also has an extra factor of \( V_{\text{out}|SE} \). The resulting currents are correct as shown. The correct equations should be:

\[
I_{\text{comp}} = \frac{\pi \cdot V_{\text{out}}}{2 R_p} \bigg|_{\text{comp}} = 3 \text{ mA}, \quad I_{\text{PMOS}} = \frac{\pi \cdot V_{\text{out}}}{R_p} \bigg|_{\text{PMOS}} = 12 \text{ mA} \quad (ys)
\]

**Page 448** In (11.8) inside the second integral sign, both terms should be multiplied by \( I_{CC} \), that is, it should be \[
\frac{1}{\pi} \int_{\theta}^{\phi} [I_{CC}(\cos \omega t - \cos \theta)]d(\omega t) \quad (gp)
\]

**Page 450** The first line after (11.15) says “the maximum distorted”. That should be “the maximum undistorted”. (gp)

**Page 464** Figure 11.29 both figures should represent switching the inductor \( L_o \) between \( V_{CC} \) and ground. But the first figure with a single switch has a gap that is shown too wide, and the second figure with two switches has a line segment missing. The correct diagram is shown below. (cp)
Page 466 In the line before 11.22 the derivative should be $\frac{d}{d\theta} V_c(\theta)$ or written inline it would probably be clearer as $d[V_c(\theta)]/d\theta$  

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