MICROELECTRONIC CIRCUIT DESIGN

THIRD EDITION

by

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Third Edition Errata - First Printing

Text Corrections

Page 33 The first answer to the exercise at the bottom of the page should be 9.20 kohms.

Page 46 The units on the vertical axis of Fig. 2.4 should be cm^{-3}.

Page 108 Exercise: 2.13 mA, 1.13 mA, -1.27 V

Page 117 Exercise: 0.912 ms, 19.7^{o}

Page 118 Exercise at bottom: 0.994 V, 1.07 V

Page 172 Units in the equation near the bottom of the page should be A/V^2

Page 178 Third exercise (25.4 uA, 6.52 V)

Page 182 Exercise answer should be 83.2 uA

Page 186 Exercise (2.22 uA, 2.96 mV)

Page 192 Last exercise 127 GHz

Page 193 Near the end of the first sentence: 10^5 V/cm

Page 217 Last answer in exercise - 1.07 mA

Page 223 Exercise answers (b) 0.300 fA, 5.26 aA, -0.305 fA

Page 229 V_{CE} in second exercise should be 5.44 V

Page 237 The units on D_n in the exercise are cm^2/s.

Page 240 First exercise - 1.24 uF

Page 250 Q-Point: (206 uA, 4.18 V)

Page 278 Fig. 6.3(a): Remove the labels and arrows indicating NM_L and NM_H.

Page 302 Exercise; I_{DD} = 278 uA

Page 305 Given Data in Ex. 6.7: 0.20 mW

Page 306 In the figure, the voltages should be V_{DSS} = 0.20 V V_{DSL} = 3.10 V

Page 321 Spice Results Table: 11000 132 64.4 0 | 11111 64.6 31.9 31.9

Page 330 Exercise: 4.47 ns --> 4.97 ns, 3.84 ns --> 2.84 ns

Page 358 Exercise: 1.27 V

Page 362 C = 0.75 pF in the first exercise. Tau_P = 2.4 x (2pF/0.75pF) x (2/1)/(8/1) = 1.6 ns Also "delay of 1.6 ns" just above the equation. The delay in Fig. 7.13(b) is also 1.6 ns.

Page 362 In the second exercise: $(W/L)_P$ = 78.8/1 $(W/L)_N$ = 31.5

Page 380 Execise: P = 12.5 mW

Page 403 Second exercise: The substrates of the PMOS devices must also be connected to V_{DD}.

Page 411 Exercise: Fall time = 1.30 ns.

Page 420 Exercise: P = 1.0 mW.

Page 424 Exercise: 3.00 V (3.66 V corresponds to an input of 5 V in Fig. 8.35(b).)

Page 454 Exercise: $-V_{EE}$ = -5.2 V

Page 456 The frequency used in the simulations is 2000 Hz, not 1000 Hz.

Page 461 Exercise answers 1.66 ns, 6.0 pJ

Page 464 Second line in Section 9.9.2 should refer to Eq. (5.30)

Page 466 First exercise: 6.00 --> 3.00

Page 469 -5.49 mA

Page 479 What is i_L if Q_4 … Answers: 92.3 mA; 9.16 mA; no

Page 519 262 ohms --> 3.82mS (1/262 ohms)

Page 520 $(A_v)^2(R_S+R_{in})/R_L$

Page 531 The numerator coefficient should be 6 x 10^6.

Page 533 The numerator of the transfer function should be multiplied by "s". Answers 25.8 kHz, 25.7 kHz

Page 549 Example 11.2: The gain of E1 should be negative, -10^9 . Ignore the first two answers in the exercise.

Page 559 Third example: -18.0, 4.50 V, -92.1 uA

Page 573 In the figure, voltage gain block E1 is upside down, and its negative input should be connected to the output terminal. Also, Gain = $+10^6$.

Page 577 Sensitivity = 3Q-1 = 1.12

Page 583 Q = 0.471

Page 587 First exercise: $V_Z > 15.6$ V

Page 594 $T_r = 13.0$ us

Page 617 44.2, 36.2, 4.20 (10.5 %), -3.60 (-9.5 %)

Page 626 Example 12.6: Known information: A = 80 dB

Page 645 Second denominator: $s + 3.16\pi \times 10^4$

Page 647 4190 Hz

Page 656 SPICE Results: $R_{in} = 28.9 \times 10^{12}$ ohms

Page 673 First Exercise (1.45 mA, 3.57 V)

Page 692 The exercise is misplaced in the text and should refer to, and follow, Exercise 13.4. -130 should be -159, -222 should be -176, and 42% should be 10%.

Page 693 Ignore $\lambda = 0.0133$/V.

Page 697 The second exercise should refer to capacitor C_2, and -145 should be -159.

Page 700 VAF should be 75 V in the SPICE simulation. Both exercise should refer to R_{iC}, not R_{out}. The exercise answers should be R_{iC} =4.85 Mohms < 6.28 Mohms. (R_{out} = 21.9 kohms).

Page 704 40.0 should be 41.5

Page 717 Second exercise: -12.5 → -24.4

Page 725 The SPICE value of the input resistance should be 14.8 kohms, not 16.0 kohms.

Page 726 Exercise: 2220--2150

Page 726 Example 13.10 - "with feedback bias" should be deleted

Page 734 In the second exercise, 9.5 V should be 4.5 V.

Page 761 Last exercise should refer to Fig.14.2. Answers: 78.1 kohms, 892 kohms

Page 766 In the equation at the top of the page, 116 kohms → 1.16 Mohms twice.

Page 767 Exercise - Largest values of v_i … 0.569 V→ 0.580 V

Page 772 Ini Eq. (14.310, R_4 → R_6

Page 778 Second Exercise: 10.4, 5.04; Third exercise: 8.48 <10.4<<176, 4.11<8.48<10.5

Page 796 0.579 uF → 6.8 uF, 12.2 nf → 0.12 uF, 6.13 nF → 0.068 uF; 0.232 uF → 2.2 uF, 714 pf → 8200 pF, 6.19 nF → 0.068 uF

Page 797 795 → 820 pF; 0.039 → 0.042 uF

Page 803 The emitter arrow should point into the transistor in Fig. 14.33.

Page 808 Eq. (14.88), V_P should be V_{TN}.

Page 811 Second exercise JFET → FET; Last exercise: -200, -50.0.

Page 820 Last exercise 1840 should be 1150

Page 842 SPICE results: V_{CE}-V_{BE} = 7.90 V and BF = 116

Page 851 5.20 → 5.30

Page 858 4.9 Gohm → 4.8 Gohm

Page 893 9.34 → 9.96; 200 uA → 189 uA; 10.6 Mohm → 10.3 Mohm

Page 903 5.94 Mohm, 1.19 Mohm

Page 906 224 ohm → 2.24 kohm

Page 932 1.25 V → 1.37 V

Page 938 SPICE Exercise Results: 64.164 uV, 0.520

Page 992 C_2 and C_3 are reversed in Fig. 16.4(c).

Page 995 At the top of the page, the results for ω_{Z2} and ω_{Z3} should be interchanged.

Page 996 First exercise "… if the value of C_2 is reduced…"

Page 999 Second exercise answers: 33.6 ms, 1.47 ms, 14.3 ms, 124 Hz

Page 1005 Second exercise answers: 24.4 ms, 1.16 ms, 6.66 Hz, 0.550

Pages 1021 & 1030 Examples 16.6 and 16.7: $C_1 = C_2 = 3.9$ uF, $C_3 = 0.082$ uF

Page 1023 Second exercise: 445 MHz; ignore the comment. Third exercise: -135, 837 kHz, 525 MHz

Page 1031 Second exercise: -29.3, 6.70 MHz, 196 MHz

Page 1033 First exercise: 48.2, 18.7 MHz, 903 MHz

Page 1041 4.20 MHz → 6.27 MHz; ignore comment.

Page 1042 22.7 MHz → 11.6 MHz

Page 1043 Exercise: 159 kHz, 39.8 kHz; C_1 should be 0.01 uF in Fig. 16.52(b).

Page 1145, Eq. (17.142) The "s" term should be $s[(C_3 + C_{GD})G + g_m C_{GD}]$

Page 1050 Second exercise: 29.6 → 23.9, 6.29 → 5.07, 296 → 239

Page 1052 First exercise: 4.59 MHz, 093.3 kHz, 49.2, -80.2. Ignore the comment at end. Second exercise: 4.59 MHz.

Page 1086 First exercise: +39.1 mS. Second exercise: -252 kohms, -0.01 mS, -71.6 kohms, 605 ohms, 863 ohms.

Page 1110 In the exercise, R_I should be R_D.

Page 1122 Exercise: 27.6^o → 69.4^o

Page 1144 Exercises: 15.9 kHz

<u>Problem Statements</u>

2.48 The second dimension in Fig. P2.48 should be 2 μm, not 3 μm

4.39 Page (c) should refer to Fig. P4.39(b).

4.134 $V_{DS} = -5$ V

7.91 Use $V_{DD} = 2.5$V

8.23 $C_{BL} = 500$ fF

11.10 & 11.18 V_S should be v_S

11.69 3-kohms should be 3-kohms

13.33 $R_S = 1$ kohms and $R_4 = 1$ kohms

14.1 In Fig. 14.1(m), the power supply should be positive: $+V_{DD}$.

14.14 V_{CC} = 15 V, $-V_{EE}$ = -15 V

14.69 C_3 = 2.2 uF.

14.76 Ignore reference to C_3.

14.115 C_3 = 2.2 uF

14.122 $C_1 = C_2 = C_3$ = 1 uF.

15.96 Ignore the last sentence in the problem statement.

15.203 Problem should refer to Prob. 15.202.

16.58 V_{CC} = +12 V.

16.65 Problem should refer to Prob. 16.14(e).

16.83 R_L is connected between the collectors of transistors Q_1 and Q_2.

17.104 The transistor parameters should be K_p = 1.25 mA/V^2 and V_{TN} = -4 V.

17.108 R_S = 820 ohms, and the transistor parameters should be K_p = 1.25 mA/V^2 and V_{TN} = -4 V.

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