

**SOLUTION :**

p-type implanted needed is the amount of:

$$N_p = \frac{1.04C}{q} = \frac{1.04 \cdot 2.2 \cdot 10^4}{1.6 \cdot 10^{-19}} = 1.42 \cdot 10^{23} \text{ cm}^{-3}$$

**3.2** Consider a diffusion area that has the dimensions 0.4m 0.2m and the abrupt junction depth is 32 nm . Its n-type impurity doping level is  $N_D = 2 \cdot 10^{20} \text{ cm}^{-3}$  and the surrounding p-type substrate doping level is  $N_A = 2 \cdot 10^{20} \text{ cm}^{-3}$  . Determine the capacitance when the diffusion area is biased at 1.2V and substrate is biased at 0V. In this problem, assume that there is no channel-stop implant.

**SOLUTION :**

$$C_j(V) = A \sqrt{\frac{q}{2} \frac{N_A N_D}{N_A + N_D} \frac{1}{\sqrt{qV}}}$$

$$= \frac{kT}{q} \ln \frac{N_A + N_D}{n_i^2} = 0.026 \ln \frac{2 \cdot 10^{20} + 2 \cdot 10^{20}}{(1.45 \cdot 10^{10})^2} = 1.21$$

$$A = 0.2 \cdot 0.4 = 0.08 \text{ cm}^2$$

$$C_j(V) = 1.18 \cdot 10^9 \sqrt{\frac{11.78 \cdot 8.854 \cdot 10^{-14} \cdot 1.6 \cdot 10^{-19} \cdot 4 \cdot 10^{20}}{2.18 \cdot 10^{21} \cdot 1.21}} \text{ [F]}$$

**3.3** Describe the relationship between the mask channel length,  $L_m$ , and the electrical channel length,  $L$ . Are they identical? If not, how would you express  $L$  in terms of  $L_m$  and other parameters?

**SOLUTION :**

The electrical channel length is related to the mask channel length by:

$$L = L_m - 2L_D$$

Where  $L_D$  is the lateral diffusion length.

# Digital Integrated Circuits Demassa Solution Manual

**WJ Hussar**



## **Digital Integrated Circuits Demassa Solution Manual:**

**Digital Integrated Circuits** DeMassa,1996-02-01 Solutions Manual to Accompany Analysis and Design of Digital Integrated Circuits David A. Hodges,Yu Chen,Horace G. Jackson,1983 *Solutions Manual Digital Integrated Circuits* CRC Press,2009-07-10 Any textbook more than five years old simply won't do in digital integrated circuits as dynamic CMOS circuits have emerged to dominate the field Providing a revised instructional text for engineers involved with Very Large Scale Integrated Circuit design and fabrication this second edition delves into the dramatic advances including new applications and changes in the physics of operation made possible by relentless miniaturization Each chapter includes numerous worked examples case studies and SPICE computer simulations The book's website offers supplementary material and more worked problems Qualifying instructors will have access to a new instructor's manual *Solutions Manual for Digital Integrated Circuits* Ayers John E,2003-09 Solution Manual to Accompany CMOS Digital Integrated Circuits : Analysis and Design, Second Edition Sung-Mo Kang,Yusuf Leblebici,1999 Books in Print Supplement ,2002 Solutions Manual Kang,1995-08-01 **Digital Integrated Circuits** Thomas A. DeMassa,Zack Ciccone,1996 Contains the most extensive coverage of digital integrated circuits available in a single source Provides complete qualitative descriptions of circuit operation followed by in depth analytical analyses and spice simulations The circuit families described in detail are transistor transistor logic TTL STTL and ASTTL emitter coupled logic ECL NMOS logic CMOS logic dynamic CMOS BiCMOS structures and various GASFET technologies In addition to detailed presentation of the basic inverter circuits for each digital logic family complete details of other logic circuits for these families are presented **Solution Manual** James W. Mayer,S. S. Lau,1990 **Solutions Manual to Accompany Digital Concepts Using Standard Integrated Circuits** Richard S. Sandige,1978 **Solutions Manual for An Introduction to Digital and Analog Integrated Circuits and Applications** Sanjit K. Mitra,Sanjit Kumar Mitra,1981 **Solutions Manual for an Introduction to Digital and Analog Integrated Circuits and Applications** Mitra,1986-01-01 *Digital Integrated Electronics [with] Solutions Manual* Herbert Taub,1977 **Electronic design with integrated circuits** David J. Comer,1981-01-01 *Digital Integrated Circuits* ,1986 **Solution Manual to Accompany Analysis and Design of Integrated Electronic Circuits** ,1987 *Integrated Circuits* Charles F. Wojslaw,1978 **Instructor's Manual for Digital Integrated Circuit Design** Ken Martin,2000 This manual is a gratis item to be given to instructors who have adopted Digital Integrated Circuit Design by Ken Martin This manual contains complete solutions prepared by the author to all of the exercises in the text **Solutions Manual to Accompany Millman, Microelectronics, Digital and Analog Circuits and Systems** Thomas V. Papathomas,Murray L. Bod,1979 *Solution Manual Digital Logic* Jefferson C. Boyce,1982

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