

FUNDAMENTALS OF SOLID-STATE ELECTRONICS

Solution Manual

CONTENTS

Preface	v
Contents	vi
List of Chapters and Appendix	vii

Chapters and Appendix

- 1 Electrons, Bonds, Bands, and Holes, 1
- 2 Homogeneous Semiconductor at Equilibrium, 21
- 3 Drift, Diffusion, Generation, Recombination, Trapping, Tunneling, 41
- 4 Metal-Oxide-Semiconductor Capacitor (MOSC), 51
- 5 P/N and Other Junction Diodes, 61
- 6 Metal-Oxide-Semiconductor and Other Field-Effect Transistors, 71
- 7 Bipolar Junction Transistor and Other Bipolar Transistor Devices, 91
- 9 Appendix – Transistor Reliability**, Objectives, Summary, 101
- 900 Introduction**, 102
- 910 Interface Traps**, 103
 - 911 Surface States on Clean Silicon Surfaces, 105
 - 912 Interface Traps on Oxidized Silicon, 106
 - 913 Interface Trap Creation-Destruction by Hydrogen, 110
 - 914 Interface Trap Generation by VUV Light, 113
 - 915 Impurity Interface Trap, 119
 - 916 Interface Trap Generation by Hot Electrons and Holes, 122
 - 917 Interface Trap Creation-Destruction at High Current Density, 129
- 920 Oxide Traps**, 131
 - 921 Atomic Configurations and Electronic Trapping at Oxide Traps, 132
 - 922 Creation and Destruction of Oxide Traps, 136
 - 923 Charging and Discharging Oxide Traps, 139
- 930 Acceptor Hydrogenation**, 141
 - 931 Atomic Configurations of Hydrogenated Acceptors, 142
 - 932 Acceptor Hydrogenation Kinetics, 147
- 940 Electromigration**, 148
 - 941 Empirical Characterization of Electromigration, 149
 - 942 Circuit Performance Limited by Interconnect Delay, 149
- 999 Bibliography and References**, 151
- 999 Problems and Solutions**, 155
 - 950 Transistor Reliability Problems and Solutions, 177–200