Acknowledgement

I express my sincere thanks to **Almighty** for providing me inspiration, strength, energy and patience to start and accomplish my work with the support of all concerned a few of them I am trying to acknowledge.

I heartily and courteously thank my guide **Prof. Satish K. Shah** who has been main source of inspiration to guide this work throughout the course of the work. He is a person with tremendous force, resources, creativity and of friendly nature. He proved himself to be the best guide by the way of inspiring to work in right direction, presenting research papers in seminars and conferences.

I thank **Prof. B.S. Parekh**, Dean, **Prof. S. M. Joshi**, Ex-Dean & Pro-vice Chancelor-MSU, and **Prof. A. I Trivedi**, Ex-Head of Department, Electrical Engineering Department, Faculty of Technology & Engineering, M. S. University of Baroda for helping me in all ways for registering me as Ph. D. student.

I also sincerely thank **Dr. D. J. Bhatt**, the then Principal of Government Engineering College, Modasa for providing enough support to register me as a PhD student. I also indebtly thank **Dr. S.N. Omkar - IISc, Bangalore, Prof. J. V. Dave, Prof. Usha Neelkantan, Prof. M. N. Patel, Dr. Ishwar B. Patel** for their continuous support, motivation and inspiration. I am also grateful to **Anand Moghe**, at elnfochips Ltd., Ahmedabad for his inspirational support.

I express my thanks to all my colleagues at GEC, Modasa & elnfochips, Ahmedabad and in particular Rambhai Patel & Chetanbhai for their help and support. Last but not least, I express my thanks to my family, wife Jayshree, Son Yash and daughter Shrujal for all support, inspiration and love provided to me with all inconveniencies caused because of my engagement in this work. November 2007 Dharmesh J. Shah

iii