PREFACE

First of all, I would like to thank all the expert contributors to this book, without whom this project would not have been possible. My deepest acknowledgments also go to those at the Scottish Microelectronics Centre who in one way or another have contributed to the science and technology described in chapter one of this book. It has been the aim that a manuscript on silicon carbide (SiC) microelectromechanical systems (MEMS) be edited so that up-to-date information can be condensed into book form, easily accessible by the academic community as well as commercial companies. The present book contains high–quality information concerning SiC MEMS for harsh environments summarised and distilled for students, academics and researchers engaging in SiC MEMS to use and, I hope, serves as a valuable contribution to the MEMS community.

Microelectromechanical systems are essentially mechanical devices/sensors at the micro–scale. Applications of MEMS are wide ranging including for instance, miniaturised sensors for acceleration and pressure, wind sensors that mimic cricket hairs and microfluidic pumps for biomedicine. The main advantage of SiC as compared to Si is naturally the mechanical and chemical stability of the material. Once the material properties favours certain types of applications such as high temperature and harsh environments, there creates an impetus to advance the science and engineering in order to progress towards the final product. It is the science and technology that this book is concerned with, from the creation of the SiC material to its formation into the final microelectromechanical system.

The following five chapters combine to give an excellent review of the state-of-the-art technology and processes for the micromachining of SiC, growth of SiC, contacts to SiC, and etching of SiC, with the final chapter focussing on the applications of SiC MEMS.

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Edinburgh, 2005