

Content

Abstract (in Chinese).....	i
Abstract (in English).....	ii
Acknowledgements.....	iii
Contents.....	iv
List of Figures.....	vi
Chapter 1 Introduction.....	1
1-1 Background.....	1
1-2 Motivation.....	2
1-3 Organization of the thesis.....	3
Chapter 2 Theory and Methodology.....	4
2-1 Introduction.....	4
2-2 Omnidirectional 1-D photonic crystal and band structure.....	6
2-2.1 One-dimensional photonic crystal and typical band structure.....	6
2-2.2 Omnidirectional band structure.....	7
2-2.3 Omnidirectional bandgap and reflection.....	8
2-3 Transfer matrix method.....	9
Chapter 3 Design and Simulation Results.....	15
3-1 Omnidirectional Reflector.....	15
3-2 Omnidirectional Dichroic Beam Splitter.....	18

3-2.1 Motivation.....	18
3-2.2 initial concept and simulation results.....	18
3-2.3 Method to design an omnidirectional dichroic beam splitter.....	20
3-2.4 One more layer for each unit cell.....	22
3-2.5 Impedance-matching layer.....	26
3-3 Angular tuning Optical Switch.....	29
3-3.1 Motivation.....	29
3-3.2 Ideal model and design step.....	29
3-3.3 Result.....	32
Chapter 4 Band Structure determined by Finite - Sized	
One - dimensional Photonic Crystal.....	34
4-1 Band structure calculated by transfer matrix method.....	34
4-2 Ripple-reduced design and applications.....	38
4-2.1 Angular tuning optical switch.....	38
4-2.2 Dichroic beam splitter.....	42
4-2.3 Display.....	44
Chapter 5 Conclusion.....	46
References.....	48