

CONTENTS

	Page No.
CERTIFICATE	.. i
ACKNOWLEDGEMENTS	.. ii
LIST OF PRINCIPAL SYMBOLS	.. vii
LIST OF FIGURES	.. xii
1. INTRODUCTION	.. 1
1.1 General	.. 2
1.2.1 Linearly Polarised Microstrip Antennas	.. 3
1.2.2 Circularly Polarised Microstrip Antennas	.. 4
1.3 Methods of Analysing Microstrip Antennas	.. 6
1.3.1 Transmission Line Model	.. 6
1.3.2 Modal-Expansion Cavity-Model	.. 7
1.3.3 Finite Element Method	.. 9
1.3.4 Segmentation Method	.. 10
1.3.5 Spectral Domain Technique	.. 10
1.3.6 Generalised Transmission Line Model	.. 11
1.3.7 Method of Moments	.. 12
1.4 Outline of Present Investigations	.. 15
1.5 Chapter Organisation	.. 16
1.6 Significant Contributions	.. 19
2. RECTANGULAR MICROSTRIP ANTENNA LOADED WITH MICROSTRIP LINES	.. 21
2.1 Introduction	.. 22
2.2 Analysis	.. 23
2.3 Numerical Results and Applications	.. 47
2.3.1 Reactively Loaded Rectangular Microstrip Antenna for Dual band Linear Polarisation..	49

	Page No.
2.3.2 Stub Loaded Square Microstrip Antenna	
for Circular Polarisation	.. 51
2.4 Conclusions	.. 58
APPENDICES	
A.2.1 Illustration of generalised Thevenin's	
Equivalent Network	.. 63
A.2.2 Expression for Dyadic Green's function due to	
Electric current Embedded in a Dielectric	
Substrate	.. 67
A.2.3 Expressions for Electric and Magnetic Fields in	
the dielectric region of a grounded dielectric	
slab due to electric current	.. 83
3. CIRCULAR MICROSTRIP DISK ANTENNA LOADED WITH	
MICROSTRIP LINES	.. 86
3.1 Introduction	.. 87
3.2 Analysis	.. 87
3.3 Numerical Results and Applications	.. 100
3.4 Conclusions	.. 108
APPENDIX	
A.3.1 Expression for Electric field in the dielectric	
region of a grounded dielectric slab due to	
electric current in Circular Polar Co-ordinates	.. 112
4. SLOT LOADED RECTANGULAR MICROSTRIP ANTENNA	.. 119
4.1 Introduction	.. 120
4.2 Analysis	.. 121
4.3 Numerical Results and Applications	.. 143
4.3.1 Slot Loaded Rectangular Microstrip Antenna	

	Page No.
for Dual band Linear Polarisation	.. 143
4.3.2 Slot Loaded Square Microstrip Antenna for Circular Polarisation	.. 144
4.4 Conclusions	.. 157
APPENDICES	
A.4.1 Illustration of generalised h-parameter Equivalent Network	.. 159
A.4.2 Expression for Dyadic Green's function due to Magnetic current Embedded in a Dielectric Substrate	... 164
A.4.3 Expression for the bidimensional Fourier transform of the magnetic current component, $M_{\xi}(\eta, \xi)$	.. 181
A.4.4 Expression for the input admittance of a slot in an infinite ground plane radiating into half space, $z > z'$	.. 183
5. SLOT LOADED CIRCULAR MICROSTRIP DISK ANTENNA	.. 190
5.1 Introduction	.. 191
5.2 Analysis	.. 191
5.3 Numerical Results and Applications	.. 203
5.4 Conclusions	.. 211
APPENDIX	
A.5.1 The expression for $V_{n'm'}^2$	.. 215
6. CONCLUSIONS AND SCOPE	.. 220
6.1 Conclusions	.. 221
6.2 Scope	.. 223
REFERENCES	.. 225