# DESIGN AND ANALYSIS OF BROADBAND ACTIVE ANTENNA


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**ABSTRACT**

DUE TO THE TREND OF FASTER SPEED AND HIGHER FREQUENCY DEMANDS ON ELECTRONIC AND TELECOMM -UNICATION SYSTEMS, THERE IS AN INCREASING PROBLEM FOR THE ELECTROMAGNETIC COMPATIBILITY ( EMC) AND ALSO THE TROUBLE ON THE MEASURING ELECTROMAGNETIC INTERFERENCE SIGNALS.THE MEASUR -EMENT PROBLEM AROSE FROM THE NATURE OF CABLE LOSS IN THE HIGH FREQUENCY RANGES(GREATER TH -AN GHZ). BECAUSE THE STRENGTH OF RECEIVED SIGNAL ATTENUATES RAPIDLY ALONG THE CABLE BETWE -EN THE RECEIVING ANTENNA AND RECEIVER,IT IS DIFFICULT AND IMPRACTICAL TO DETECT AND ANALY -ZE THE HIGH FREQUENCY SIGNAL(EVEN INSTALL AN PRE-AMPLIFIER IN FRONT OF RECEIVER).THE THES -IS INVESTIGATES THE DESIGN OF BROADBAND ACTIVE ANTENNA WITH MODERATE GAIN OVER THE FREQUE -NCY RANGE 1GHZ GHZ, AND THUS TO SOLVE THE MEASUREMENT PROBLEM FOR HIGH FREQUENCY EMI AND RF TESTS. THE WORKS OF THE THESIS IS FIRST TO IMPLEMENT THE S-PARAMETERS OF AMPLIFIER MODU -LE FROM MANUFACTURER (MINI-CIRCUIT),THEN USE THE MICROWAVE AMPLIFIER DESIGN PRINCIPLES AN -D UTILIZE THE MICROWAVE CIRCUIT DESIGN SOFTWARE (MICROWAVE OFFICE 2000) TO SIMULATE AND A -NALYZE THE LOW NOISE AMPLIFIER (LNA), FINALLY USE THE LUMP ELEMENTS AND MICROSTRIP LINES TO MATCH THE IMPEDANCES, AND THEREFORE FINE-TUNE THE LNA PERFORMANCE ON THE PRINTED CIRCUI -T BOARD (FR4). AFTER THE LNA CIRCUIT IS FINISHED, IT IS MOUNTED ON THE DEDICATED HORN ANT -ENNA TO MEASURE THE S-PARAMETERS AND ANTENNA PATTERNS OF THE INTEGRATED ACTIVE ANTENNA SY -STEM. THE SYSTEM MEASUREMENT IS CONDUCTED IN THE CSIST AND PROVED TO BE EFFECTIVE FOR THE HIGH FREQUENCY MEASUREMENTS.



Keywords : EMC ; EMI ; RF ; Lump Element ; Microstrip Line


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