

James Cook University

Electrical and Computer Engineering

EE4306 RF Design Assignment

Aim

The aim of this assignment is to firstly provide some experience in the design and optimisation of RF circuits.

Requirements:

Design an RF filter to be able to be manufactured on a Rogers RO4003 substrate. The filter should occupy as small a PCB board area as possible consistent with meeting the specifications. The filter should have a flat amplitude response within ± 0.25 dB over the specified bandwidth (either 10% or 7.5% of the centre frequency). The attenuation at 5 times the bandwidth, or more, away from the centre frequency must be more than 60 dB, with the exception that the attenuation, for a 2 times the bandwidth region around harmonics of the centre frequency, should be at least 40 dB.

Each student is given a different filter to design, according to the following table:

Surname	Given Names	Centre Frequency	% Bandwidth
ACERET	JAMES ROBERT	800	5
ASHWORTH	RAYMOND	825	5
AU YEUNG	TAT FUNG	850	5
CAHILL	DAMIEN PAUL	875	5
CANTAMESSA	ANDREW PAUL	900	5
CLARKE	STEPHEN PETER	925	5
CRAVEN	LEON MICHAEL	950	5
DAVIDSON	ADAM LEIGH	975	5
EASSIE	STUART RYAN	1000	5
EFFORD	MICHAEL ALBERT	1025	5
ELKINS	TIMOTHY KENNETH	1050	5
HAN	AIK KWANG	800	7.5
HOH	TONG YU	825	7.5
KIENZNER	SIMON	850	7.5
KINGSUN	BENJAMIN JAMES	875	7.5
KNACK	ADRIAN PETER	900	7.5
LAMARI	PETER DAMIEN	925	7.5
LIU	WALTER	950	7.5
ODMAN	BENJAMIN VICTOR	975	7.5
PRIOR	SAMUEL GREGORY	1000	7.5
RANTUCCI	GIOVANNI THOMAS	1025	7.5
SIM	NIGEL GRAHAM	1050	7.5
WILLIS	SIMON LIAM	1075	7.5

The design to be produced by each student should include a full PCB payout and its corresponding Gerber plot file. All the circuits are to be designed using Rogers RO4003 PCB. The board that is available is 0.032 inch thick and has 1 oz copper cladding. PCB mounting BNC connectors are to be used for the connectors.

Each student has to write a report providing full design, layout and optimisation details of the design. The circuit schematic design must be verified by an EMI simulation. The design report is to be submitted by 10am on the 13th of October.

C. J. Kikkert
12 September 2003