

**UNIVERSITI TEKNOLOGI MARA  
CAWANGAN PULAU PINANG**

**A TRI-BAND ANTENNAS FOR  
SATELLITE APPLICATION AT L, S  
AND C BANDS**

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**BACHELOR OF ENGINEERING  
(HONS) ELECTRICAL AND  
ELECTRONIC ENGINEERING**

July 2020

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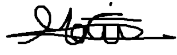
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## AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations, Universiti Teknologi MARA, regulating the conduct of my study and research.

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## **ABSTRACT**

In this paper, this project is about to develop a tri-band antenna for L, S and C band satellite application. It is the best option for microstrip designing antenna by using coaxial feed technique due to the smallest size, low cost and can provide safe space for designing this tri-band antenna. This antenna is designed for satellite uses from Ultra High Frequency (UHF) to Super High Frequency (SHF) applications. By using Computer Simulation Technology (CST) Studio Suite 2019 software, this design is analysed. This antenna design support frequencies of 1.5GHz for L band, 3.03GHz for S band and 4.37GHz for C band. These antennas propose the radiation pattern such as omnidirectional and directional pattern. The specification of this tri-band antenna includes a FR-4 substrate that has relative permittivity 4.3, while the substrate and copper thickness is 1.6 mm and 0.035 mm. For all tri-band antenna the return loss is -25.6 dB for L band, -14.6dB for S band and -14.6 dB for C band. The perfect way to get the best performance for the diamond-shaped tri-band antenna as its patch uses a Rogers substrate and it's also easy to design without adding additional elements to the antenna.

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Alhamdulillah