

ABSTRAK

Di dalam dunia teknik elektro, Radar mempunyai kegunaan yang sangat penting dalam berbagai bidang, seperti dalam bidang telekomunikasi. Radar juga sering digunakan untuk mengukur jarak sebuah objek dan membuat map benda-benda seperti pesawat terbang, kendaraan bermotor dan informasi cuaca. Hal yang penting dalam sistem radar yaitu *filter*. *Filter* sendiri berfungsi untuk meloloskan frekuensi yang diinginkan. Pada Tugas Akhir ini membahas tentang *Band Pass Filter* sederhana yang bekerja pada radar dengan frekuensi kerja 2,75 GHz-2,85 GHz. *Filter* didisain pada frekuensi tengah 2,8 GHz dengan nilai *return loss* ≤ -20 dB, *insertion loss* ≥ -3 dB, dan *bandwidth* sebesar 100 MHz dan direalisasikan kedalam bentuk mikrostrip *Square Open Loop Resonator*. *Filter* ini menggunakan jenis substrat *Rogers R04350B* dengan nilai konstanta dielektrik (ϵ_r) sebesar 3,48, dan ketebalan substrat (h) sebesar 1,524 mm. Simulasi dilakukan dengan menggunakan software *Computer System Technology (CST) suite 2015* dan mendapatkan hasil untuk nilai *return loss* -31,608995 dB, *insertion loss* -2,0529871 dB, *bandwidth* 100 MHz. Setelah itu direalisasikan dan diukur dengan *Network Analyzer* dan mendapatkan hasil untuk *return loss* -23,519 dB, *insertion loss* -2,183 dB dan *bandwidth* 90 MHz.

Kata Kunci : *Band Pass Filter*, CST, Mikrostrip, *Square Open Loop Resonator*.

ABSTRACT

In the world of Electrical Engineering, Radar is one of the importance main system that has multi-functional benefit particularly in telecommunication industry. This technology rapidly growing to fulfil the market demand. As a common practice radar system frequently used to measure the distance of an object, provides mapping location of the aircraft and vehicles as well as weather information. Therefore the most important element in radar systems is the filter optimization. From the application of filter functionality, filter has main role to controlling the frequency and release the expected frequency. However in this final research will focusing on the operation of simple Band Pass Filter with concern on 2,75 GHz – 2,85 GHz radar frequency. Filter designed at 2.8 GHz as the center frequency within a value return loss ≤ -20 dB , insertion loss ≥ -3 dB and a bandwidth of 100 MHz. henceforth realized with converting into Microstrip Square Open Loop Resonator. These particular filter used the type of substrate Rogers R0435B with dielectric constant values (ϵ_r) at 3,48 , and the thickness of the substrate (h) of 1,524 mm. Simulations performed using software Computer System Tecnology (CST) suite 2015 and assigned the results to return loss value -31,608995 dB, -2,0529871 dB insertion loss , bandwidth 100 MHz . Subsequently realized and measured by netwok Analyzer and perform results to return loss -23,519 dB , insertion loss -2,183 dB and banwidth 90 MHz .

Keywords: Band Pass Filter, CST, Microstrip, Square Open Loop Resonator.





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