

ABSTRAK

Sistem radar maritim pada kapal laut Indonesia begitu pesat seiring dengan perkembangan zaman. Namun pada radar maritim masih sangat kecil jangkauannya mengakibatkan masalah pendeteksi pada radar maritim masih kurang. Sehingga diperlukan sebuah perangkat antena yang dapat meningkatkan *gain* dan memperlebar *bandwidth* agar dapat mendeteksi benda yang jauh. Metode array berguna memperoleh *gain* maksimal dan memperlebar *bandwidth* serta untuk mereduksi dimensi antena. Simulasi yang digunakan yaitu *software AWR Microwave Office 2009*. Standar spesifikasi yang harus dipenuhi ialah, $VSWR \leq 2$, $return\ loss \leq -10\ dB$, $gain \geq 10\ dB$ dan $bandwidth \geq 500\ MHz$ serta pola radiasi *unidirectional*. Antena dirancang *unidirectional*, bahan substrat FR4-Epoxy nilai konstanta dielektrik 4,3, *loss tangent* 0,0265, ketebalan 1,6 mm. Hasil simulasi rancangan antena mikrostrip *rectangular array 2x2* diperoleh nilai *return Loss* -22,34 dB, $VSWR$ 1,329 dB, *gain* 10,05 dB, *bandwidth* 1474 MHz dan pola radiasi *unidirectional*. Hasil yang didapat sudah sesuai dengan standar spesifikasi pada Radar Maritim

Kata Kunci: Antena Mikrostrip, Array, Bandwidth, Radar Maritim

ABSTRACT

The maritime radar system on Indonesian ships is growing rapidly along with the times. However, the maritime radar is still very small in scope, resulting in a lack of detection problems on maritime radar. So we need an antenna device that can increase the gain and widen the bandwidth in order to detect objects that are far away. The array method is useful for obtaining maximum gain and widening the bandwidth as well as for reducing the dimensions of the antenna. The simulation used is AWR Microwave Office 2009 software. The standard specifications that must be met are, VSWR 2, return loss -10 dB, gain 10 dB and bandwidth 500 MHz and unidirectional radiation pattern. The antenna is designed to be unidirectional, the substrate material is FR4-Epoxy, the dielectric constant value is 4.3, the loss tangent is 0.0265, the thickness is 1.6 mm. The simulation results of the 2x2 rectangular microstrip array antenna design show that the return loss is -22.34 dB, VSWR is 1.329 dB, gain is 10.05 dB, bandwidth is 1474 MHz and radiation pattern is unidirectional. The results obtained are in accordance with the standard specifications on the Maritime Radar

Keywords: Microstrip Antenna, Array, Bandwidth, Maritime Radar