

## ABSTRACT

Super-wideband (SWB) antenna become eagerly demanding to cover both short and long range transmission for ubiquitous services because UWB antenna are not efficient enough to diverse the communication systems. Distinctively, SWB does not have predefined range of operating frequency and need to maintain a return loss less than -10 dB and VSWR less than 2 over the entire frequency range of 10:1 bandwidth ratio whereas UWB should attain an absolute minimum bandwidth of 500 MHz or a minimum fractional bandwidth of 20%. This thesis use insertion of slot method in frequency range of 1-30 GHz on the antenna system expected to achieve SWB. This thesis also use microstrip circular patch, the tapered coplanar waveguide (CPW) feed and spline curved ground plane method. This thesis gradually simulated and analyzed 4 model SWB planar antenna with tapered CPW feed, circular shape patch, and curved spline groundplane using slot in frequency range of 1-30 GHz. Simulated with FR-4 substrate with 4.3 dielectric constant, and thickness of 1.6 mm. The SWB planar antenna with tapered CPW feed, circular shape patch, and curved spline groundplane using slot have achieve total bandwidth of 96.01% (single-band) that achieve SWB bandwidth ratio of 13.91:1. The final result managed to get a SWB antenna that works in 2.1579 - 30 GHz and deeper minimum return loss at -45.5482 GHz.

**Keyword:** *ultra wideband antenna, super wideband antenna, coplanar waveguide, ground plane, microstrip circular patch antenna, planar antenna, slot antenna.*