

1.0 Antenna Design

The antenna for PN 41-5800-0012, also referred to as “5800 RF TX”, was designed based on Micrel/Microchip’s design notes to go with the MICRF112 integrated circuit. These documents are being sent with this document for reference:

- a. TX112PCB_Layout.doc
- b. TX112_ANT_DIM_TOP.pdf
- c. TX112_ANT_DIM_BOT.pdf

These describe the layout of the antenna, and where the ground plane should stop. There is an example layout of the RF IC and associated components, which was used as a reference, but some changes were made, since the components used and the components in the example were not one-to-one.

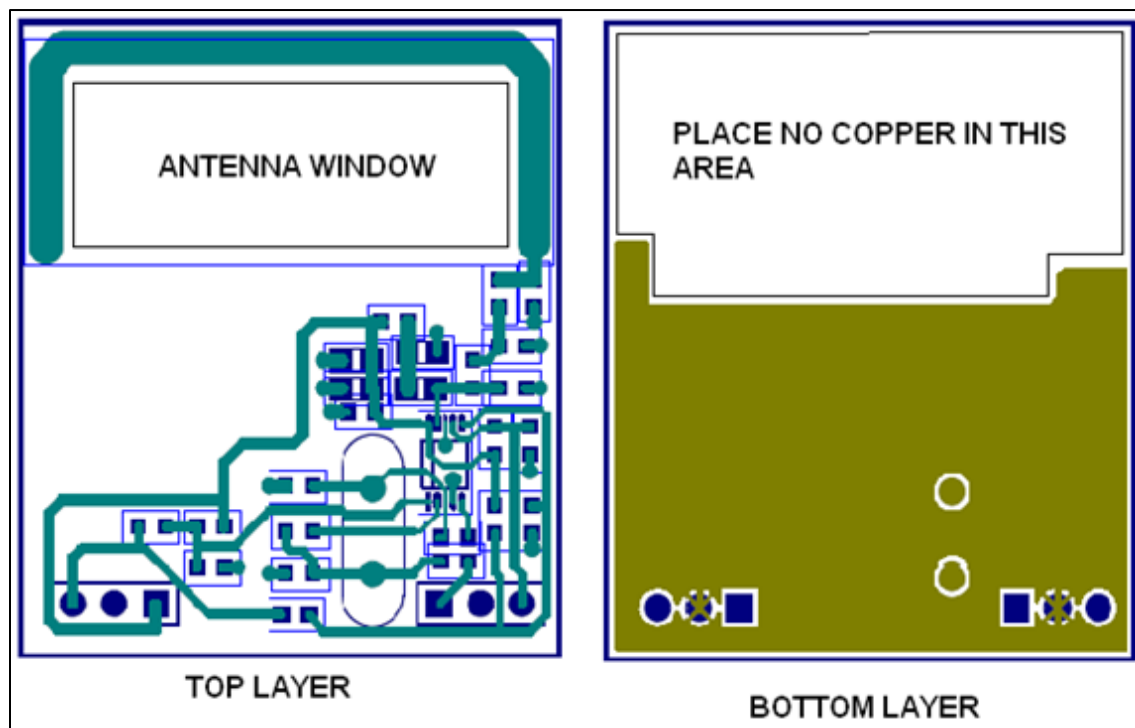


Figure 1: Excerpt from TX112PCB_Layout.doc

Antenna Construction Report

2.0 41-5800-0012 Antenna Details

The PCBA for the 41-5800-0012 is a four layer PCBA. However, all traces and planes, except the antenna traces, stop before the antenna region, as specified by the MICRF112 antenna recommendations, as can be seen in Figure 2. Also visible in Figure 2, is the actual dimensions of the 41-5800-0012 board.

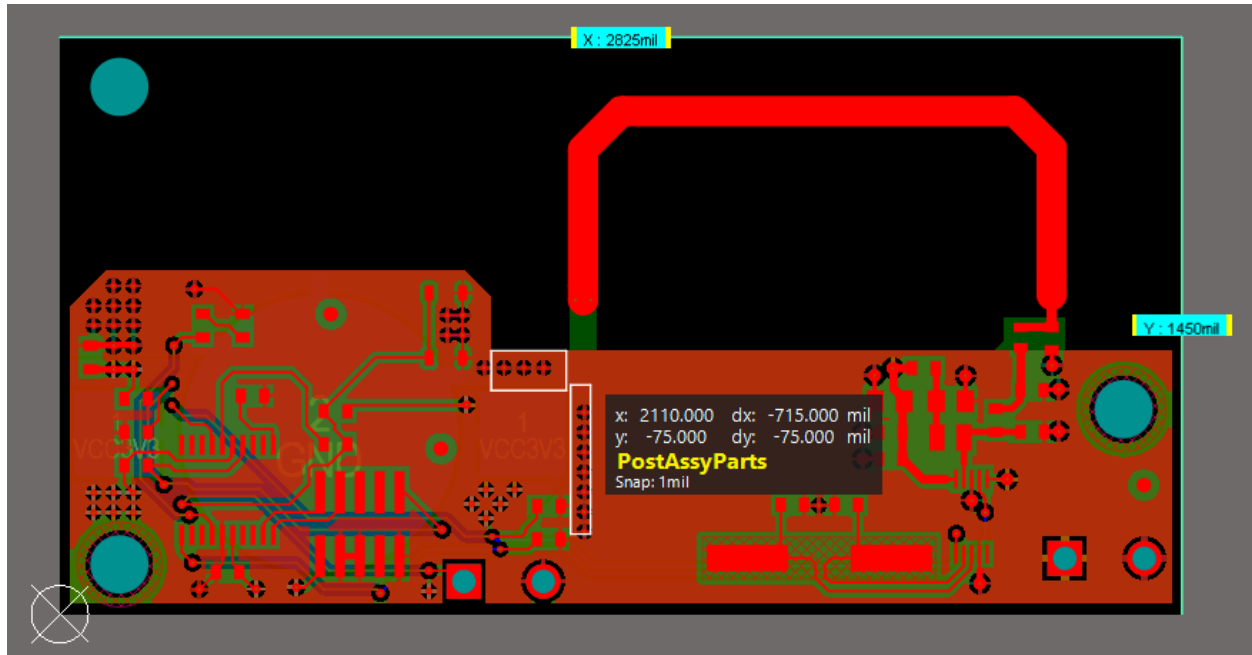


Figure 2: 41-5800-0012 Layout, Viewed in Altium

Figure 3 shows the layer stackup for the PCB. In the antenna region, the Ground and Power layers have been removed. This means the total dielectric thickness between the top and bottom traces is approximately 55.6mils +/-13%. Both the top and bottom antenna traces are 1oz copper.

Antenna Construction Report

#	Name	Material	Type	Weight	Thickness	Dk	Df
	Top Overlay		Overlay				
	Top Solder	SM-001	Solder Mask		1mil	4	0.03
	Top Surface Fini...	PbSn	Surface Finish		0.787mil		
1	Top Layer	CF-004	Signal	1oz	1.378mil		
	Dielectric 2	PP-006	Prepreg		2.8mil	4.1	0.02
2	Ground	CF-004	Signal	1oz	1.378mil		
	Dielectric 1	Core-043	Core		50mil	4.3	0.02
3	Power	CF-004	Signal	1oz	1.378mil		
	Dielectric 3	PP-006	Prepreg		2.8mil	4.1	0.02
4	Bottom Layer	CF-004	Signal	1oz	1.378mil		
	Bottom Surface...	PbSn	Surface Finish		0.787mil		
	Bottom Solder	SM-001	Solder Mask		1mil	4	0.03
	Bottom Overlay		Overlay				

Figure 3: 41-5800-0012 Layer Stackup

The upward protrusion of the planes to the left of the antenna starts 191mils (4.85mm) away and is outside the current loop of the antenna. The dimensions of the plane, nearest the antenna, can be see in Figure 4.

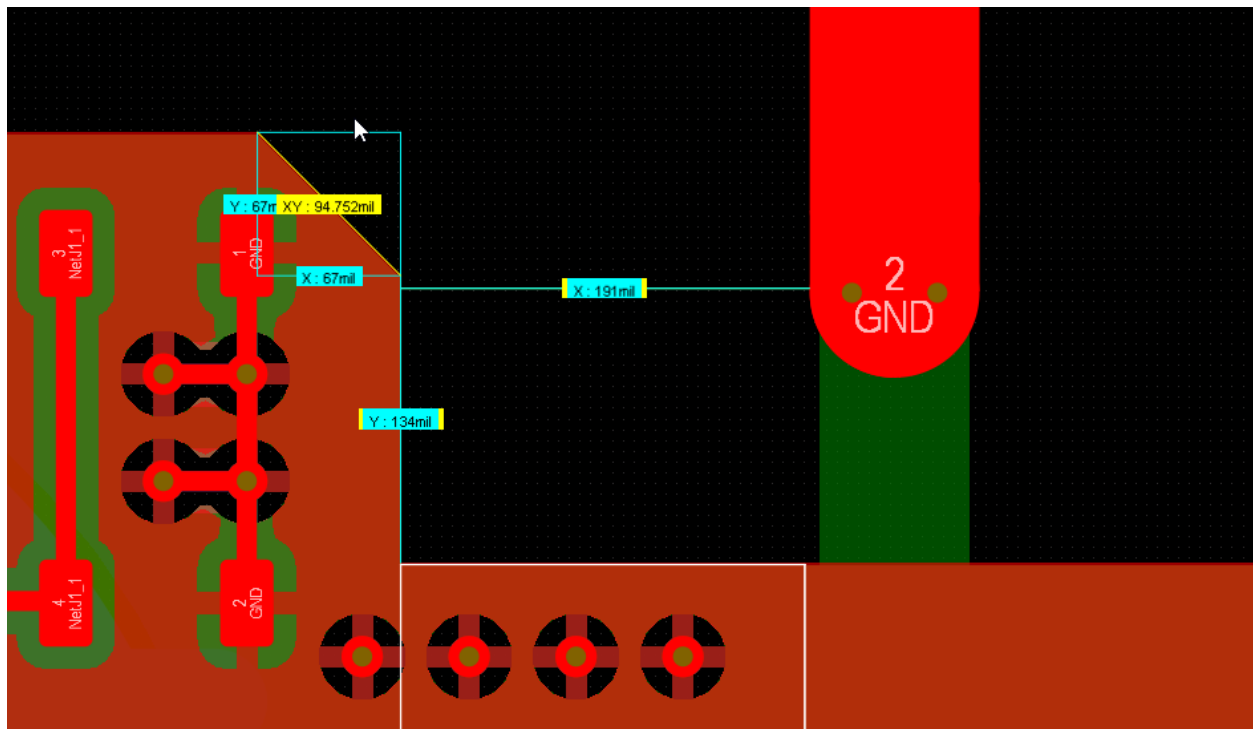


Figure 4: Dimensions of Plane Protrusion, Near Antenna

Antenna Construction Report

Finally, exact dimensions of the antenna were used from the dimensions in the referenced documents TX112_ANT_DIM_TOP.pdf and TX112_ANT_DIM_BOT.pdf (included with this package, and referenced in Figure 5 and Figure 6). The layout of the RF circuit and board dimensions varies.

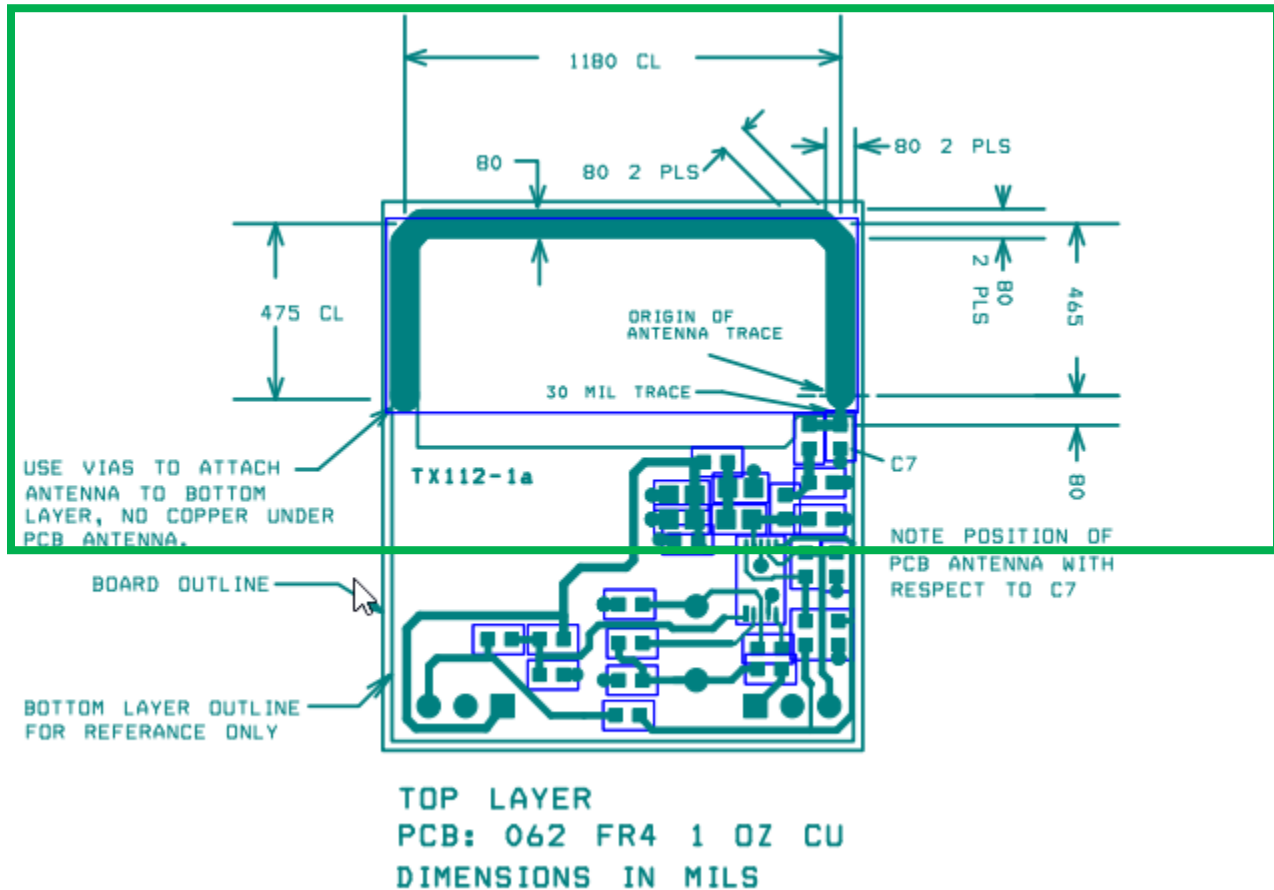


Figure 5: Antenna Layout – Top Layer

TX112-1a Assembly
BOTTOM LAYER

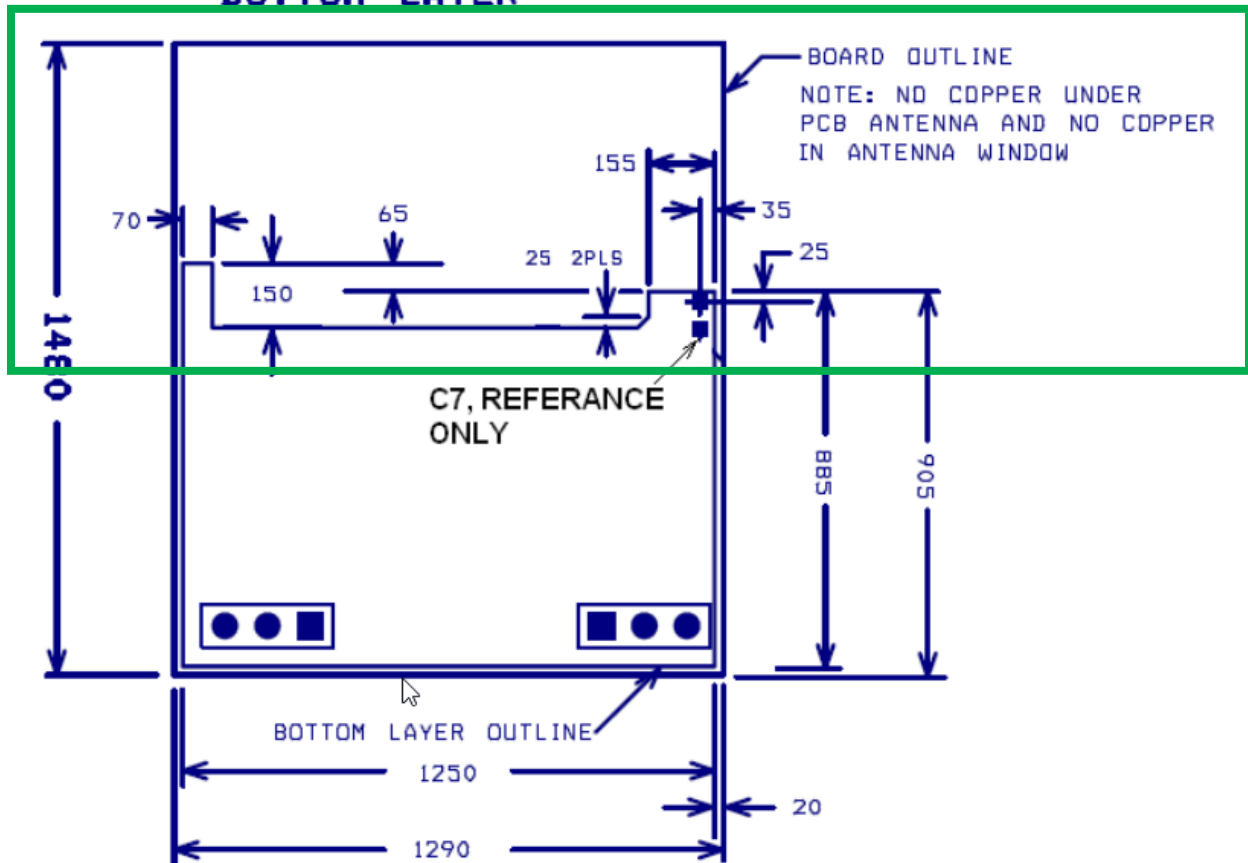


Figure 6: Antenna Layout – Bottom Layer