

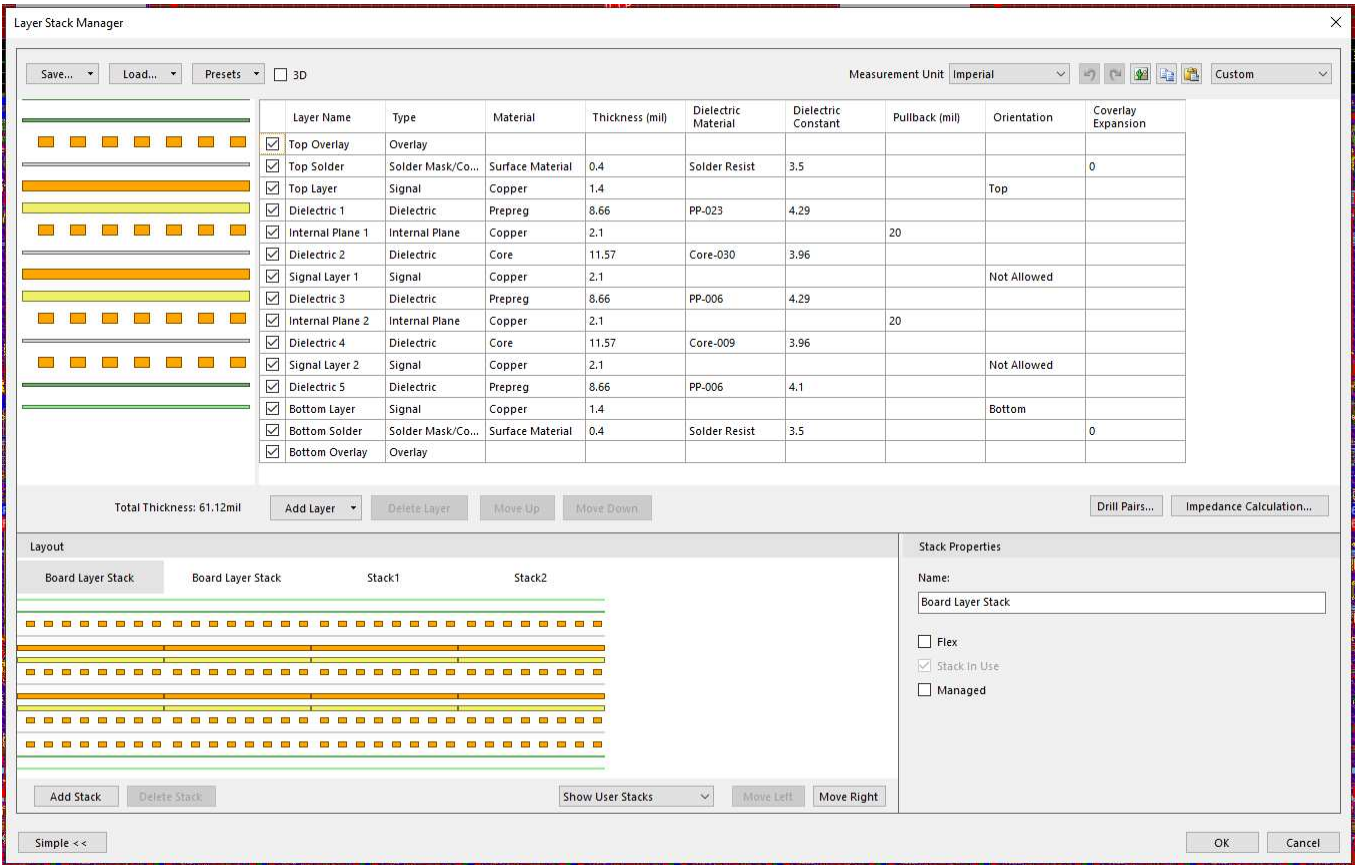
Board Stackup Evaluation

PCB Layering:

The Rev. F (and presumably G) uses a 4-layer PCBs and Rev. H uses a 6-layer. Because of the need for diagnostics and associated routing, a 6-layer PCB will be used for Rev. I, similar to Rev. H.

Stackup comparison:

The Rev. H stackup is shown below based on the Altium files.



Although it will not be used, the Rev. F stackup is shown below for reference.

Layer Stack Manager

Save... Load... Presets 3D Measurement Unit Imperial Layer Pairs

Layer Name	Type	Material	Thickness (mil)	Dielectric Material	Dielectric Constant	Pullback (mil)	Orientation	Coverlay Expansion
Top Overlay	Overlay							
Top Solder	Solder Mask/Co...	Surface Material	0.4	Solder Resist	3.5			0
Top Layer	Signal	Copper	1.4				Top	
Dielectric1	Dielectric	None	12.6	FR-4	4.8			
Mid-Layer 1	Signal	Copper	1.4				Not Allowed	
Dielectric2	Dielectric	None	12.6	FR-4	4.8			
Mid-Layer 2	Signal	Copper	1.4				Not Allowed	
Dielectric3	Dielectric	None	12.6	FR-4	4.8			
Bottom Layer	Signal	Copper	1.4				Bottom	
Bottom Solder	Solder Mask/Co...	Surface Material	0.4	Solder Resist	3.5			0
Bottom Overlay	Overlay							

Total Thickness: 44.2mil Add Layer Delete Layer Move Up Move Down Drill Pairs... Impedance Calculation...

Advanced >> OK Cancel

Rev. I PCB manufacturing:

JLCPCB manufactured the PCBs for Filter Evaluation and the products were satisfactory, so they were investigated for manufacturing the ARX Rev. I prototype PCBs. The PCBs will be 6-layer, 1.6 mm thick with 1 oz copper on the outer layers and 2 oz copper on the inner layers. JLCPCB has only one “Impedance Controlled” 6-layer stackup for the required configuration as shown below. Note that the “No requirement stackup” is identical to the “JLC061612-1080 stackup”.

6-Layer Impedance Control Stackup

Thickness

1.2mm 1.6mm 2.0mm

Outer Copper Weight

1oz 2oz

inner Copper Weight

0.5oz 1oz 2oz

1) No requirement Stackup

Layer	Material Type	Thickness	
Layer	Copper	0.035mm	
Prepreg	1080*1	0.084mm	
Prepreg	1080*1	0.0535mm	
inner Layer	Copper	0.061mm	
Core>	Core	0.35mm	0.35mm (with copper core)
inner Layer	Copper	0.061mm	
Prepreg	1080*1	0.0535mm	
Prepreg	2116*1	0.124mm	
Prepreg	1080*1	0.0535mm	
inner Layer	Copper	0.061mm	
Core>	Core	0.35mm	0.35mm (with copper core)
inner Layer	Copper	0.061mm	
Prepreg	1080*1	0.0535mm	
Prepreg	1080*1	0.084mm	
Layer	Copper	0.035mm	

2) JLC061612-1080 Stackup

Layer	Material Type	Thickness	
Layer	Copper	0.035mm	
Prepreg	1080*1	0.084mm	
Prepreg	1080*1	0.0535mm	
inner Layer	Copper	0.061mm	
Core>	Core	0.35mm	0.35mm (without copper core)
inner Layer	Copper	0.061mm	
Prepreg	1080*1	0.0535mm	
Prepreg	2116*1	0.124mm	
Prepreg	1080*1	0.0535mm	
inner Layer	Copper	0.061mm	
Core>	Core	0.35mm	0.35mm (without copper core)
inner Layer	Copper	0.061mm	
Prepreg	1080*1	0.0535mm	
Prepreg	1080*1	0.084mm	
Layer	Copper	0.035mm	

Comparison of Rev. H ARX 6-layer stackup with JLCPCB 6-layer stackup:

Rev. H							JLCPCB	JLC061612-1080 Stackup		
Layer name	Type	Material	Thickness (mil)	Dielectric material	Dielectric constant		Layer	Material	Thickness (mil)	Dielectric constant
Top overlay	Overlay									
Top solder	Soldermask	Surface material	0.4	Solder resist	3.5		Coating	C2	0.6	3.8
Top layer	Signal	Copper	1.4				Signal	Copper	1.38	
Dielectric 1	Dielectric	Prepreg	8.66	PP-023	4.29		Dielectric	Prepreg	5.4	3.91
Internal plane 1	Internal plane	Copper	2.1				Internal plane	Copper	2.4	
Dielectric 2	Dielectric	Core	11.57	Core-030	3.96		Dielectric	Core	13.78	4.6
Signal layer 1	Signal	Copper	2.1				Signal	Copper	2.4	
Dielectric 3	Dielectric	Prepreg	8.66	PP-006	4.29		Dielectric	Prepreg	9.1	3.91 + 4.16 + 3.91
Internal plane 2	Internal plane	Copper	2.1				Internal plane	Copper	2.4	
Dielectric 4	Dielectric	Core	11.57	Core-009	3.96		Dielectric	Core	13.78	4.6
Signal layer 2	Signal	Copper	2.1				Signal	Copper	2.4	
Dielectric 5	Dielectric	Prepreg	8.66	PP-006	4.1		Dielectric	Prepreg	5.4	3.91
Bottom layer	Signal	Copper	1.4				Signal	Copper	1.38	
Bottom solder	Soldermask	Surface material	0.4	Solder resist	3.5		Coating	C2	0.6	3.8
Bottom overlay	Overlay									
		Total thickness	61.12						Total thickness	61.02

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