



Storm Circuit Technology Ltd

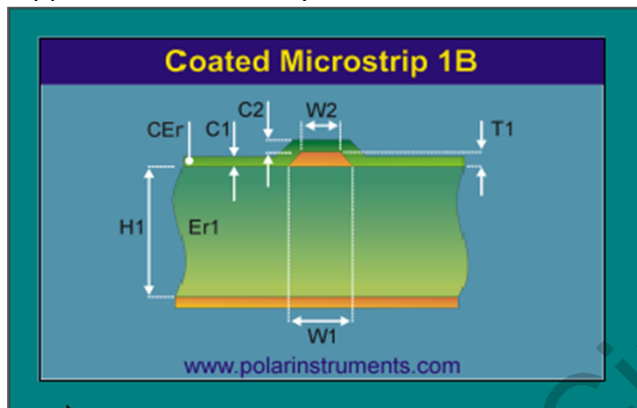
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As a PCB manufacturer,we made a lot of impedance PCBs.Here are some of our suggestions for impedance calculation
The most important is the Er,H,W and T. Er is material dielectric constant.H is the dielectric thickness.W is trace width.
and T is trace thickness.The following are the calcluation models and stackups we often use.

Outer layer—Single type

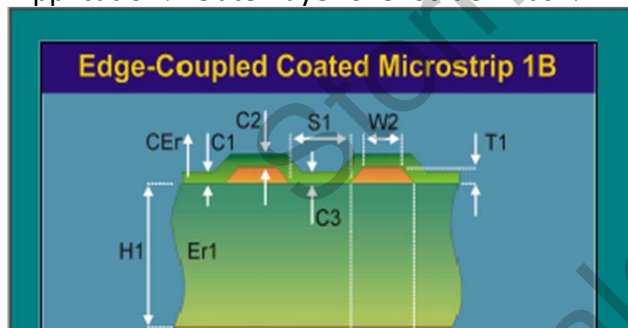
Application: Outer layer over solder mask:



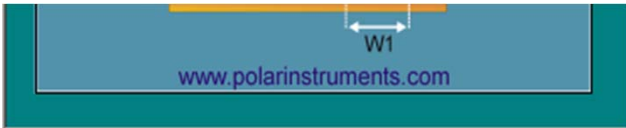
H1: Dielectric thickness
Er1:Material DK
W1:Trace Width(bottom)
W2:Trace Width(top)
T1:Copper thickness
C1:soldermask thickness over raw material
C2:solder mask thickness over copper
CEr:Solder mask Dk

Outer layer—Diff Type

Application: Outer layer over solder mask:



H1: Dielectric thickness
Er1:Material DK
W1:Trace Width(bottom)
W2:Trace Width(top)
S1:Trace space
T1:Copper thickness
C1:soldermask thickness over raw material
C2:solder mask thickness over copper



C3:soldermask thickness over raw material
 CEr:Solder mask Dk

If you do not know what the trace width you can design,pls follow below stackups.These are simples exampls for you. Of course,the impedance is a bit complex,our stackups are only for reference.

4 layer 0.8mm 7628PP

Layer	Type	Thickness		Trace layer	Type	Value	Trace
L1		0.035mm		Outer	Single	50ohm	12mil
PP	7628*1	0.2mm		Outer	Diff	100ohm	8/8mil
L2		0.0175mm		Outer	Diff	90ohm	10/8mil
Core	FR4*1	0.265mm	0.3mm (inc copper)	Inner	Single	50ohm	10mil
L3		0.0175mm		Inner	Diff	100ohm	6/8mil
PP	7628*1	0.2mm		Inner	Diff	90ohm	8/8mil
L4		0.035mm					
	Finished	0.8mm					

4 layer 0.8mm 2313PP

Layer	Type	Thickness		Trace layer	Type	Value	Trace
L1		0.035mm		Outer	Single	50ohm	6mil
PP	2313*1	0.1mm		Outer	Diff	100ohm	5/8mil
L2		0.0175mm		Outer	Diff	90ohm	6/8mil
Core	FR4*1	0.465mm	0.5mm (inc copper)	Inner	Single	50ohm	6mil
L3		0.0175mm		Inner	Diff	100ohm	4/8mil
PP	2313*1	0.1mm		Inner	Diff	90ohm	5/8mil
L4		0.035mm					
	Finished	0.8mm					

4 layer 1.0mm 2313PP

Layer	Type	Thickness		Trace layer	Type	Value	Trace
L1		0.035mm		Outer	Single	50ohm	6mil
PP	2313*1	0.1mm		Outer	Diff	100ohm	5/8mil
L2		0.0175mm		Outer	Diff	90ohm	6/8mil
Core	FR4*1	0.665mm	0.7mm (inc copper)	Inner	Single	50ohm	5mil

L3		0.0175mm		Inner	Diff	100ohm	4/8mil
PP	2313*1	0.1mm		Inner	Diff	90ohm	5/8mil
L4		0.035mm					
	Finished	1.0mm					

4 layer 1.0mm 7628PP

Layer	Type	Thickness		Trace layer	Type	Value	Trace
L1		0.035mm		Outer	Single	50ohm	12mil
PP	7628*1	0.2mm		Outer	Diff	100ohm	8/8mil
L2		0.0175mm		Outer	Diff	90ohm	10/8mil
Core	FR4*1	0.465mm	0.5mm (inc copper)	Inner	Single	50ohm	10mil
L3		0.0175mm		Inner	Diff	100ohm	6/8mil
PP	7628*1	0.2mm		Inner	Diff	90ohm	8/8mil
L4		0.035mm					
	Finished	1.0mm					

4 layer 1.2mm 7628PP

Layer	Type	Thickness		Trace layer	Type	Value	Trace
L1		0.035mm		Outer	Single	50ohm	12mil
PP	7628*1	0.2mm		Outer	Diff	100ohm	8/8mil
L2		0.0175mm		Outer	Diff	90ohm	10/8mil
Core	FR4*1	0.665mm	0.7mm (inc copper)	Inner	Single	50ohm	10mil
L3		0.0175mm		Inner	Diff	100ohm	6/8mil
PP	7628*1	0.2mm		Inner	Diff	90ohm	8/8mil
L4		0.035mm					
	Finished	1.2mm					

4 layer 1.2mm 2313PP

Layer	Type	Thickness		Trace layer	Type	Value	Trace
L1		0.035mm		Outer	Single	50ohm	6mil
PP	2313*1	0.1mm		Outer	Diff	100ohm	5/8mil
L2		0.0175mm		Outer	Diff	90ohm	6/8mil
Core	FR4*1	0.865mm	0.9mm (inc copper)	Inner	Single	50ohm	5mil
L3		0.0175mm		Inner	Diff	100ohm	4/8mil
PP	2313*1	0.1mm		Inner	Diff	90ohm	5/8mil
L4		0.035mm					

Finished	1.2mm
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4 layer 1.6mm 7628PP

Layer	Type	Thickness		Trace layer	Type	Value	Trace
L1		0.035mm		Outer	Single	50ohm	11.5mil
PP	7628*1	0.2mm		Outer	Diff	100ohm	8/8mil
L2		0.0175mm		Outer	Diff	90ohm	10/8mil
Core	FR4*1	1.065mm	1.1mm (inc copper)	Inner	Single	50ohm	9.5mil
L3		0.0175mm		Inner	Diff	100ohm	6/8mil
PP	7628*1	0.2mm		Inner	Diff	90ohm	8/8mil
L4		0.035mm					
	Finished	1.6mm					

4 layer 1.6mm 2313PP

Layer	Type	Thickness		Trace layer	Type	Value	Trace
L1		0.035mm		Outer	Single	50ohm	6mil
PP	2313*1	0.1mm		Outer	Diff	100ohm	5/8mil
L2		0.0175mm		Outer	Diff	90ohm	6/8mil
Core	FR4*1	1.265mm	1.3mm (inc copper)	Inner	Single	50ohm	5mil
L3		0.0175mm		Inner	Diff	100ohm	4/8mil
PP	2313*1	0.1mm		Inner	Diff	90ohm	5/8mil
L4		0.035mm					
	Finished	1.6mm					

4 layer 2.0mm 7628PP

Layer	Type	Thickness		Trace layer	Type	Value	Trace
L1		0.035mm		Outer	Single	50ohm	11.5mil
PP	7628*1	0.2mm		Outer	Diff	100ohm	8/8mil
L2		0.0175mm		Outer	Diff	90ohm	10/8mil
Core	FR4*1	1.465mm	1.5mm (inc copper)	Inner	Single	50ohm	12mil
L3		0.0175mm		Inner	Diff	100ohm	8/8mil
PP	7628*1	0.2mm		Inner	Diff	90ohm	6/8mil
L4		0.035mm					
	Finished	2.0mm					

6 layer 1.2mm 2313PP

Layer	Type	Thickness		Trace layer	Type	Value	Trace
L1		0.035mm		Outer	Single	50ohm	6mil
PP	2313*1	0.1mm		Outer	Diff	100ohm	5/8mil
L2		0.0175mm	0.4mm (inc copper)	Outer	Diff	90ohm	6/8mil
Core	FR4*1	0.365mm		Inner	Single	50ohm	14mil
L3		0.0175mm		Inner	Diff	100ohm	8/8mil
PP	2116*1	0.127mm		Inner	Diff	90ohm	10.5/8mil
L4		0.0175mm	0.4mm (inc copper)				
Core	FR4*1	0.365mm		Inner			
L5		0.0175mm					
PP	2313*1	0.1mm					
L6		0.035mm					
	Finished	1.2mm					

6 layer 1.6mm 2313PP

Layer	Type	Thickness		Trace layer	Type	Value	Trace
L1		0.035mm		Outer	Single	50ohm	6mil
PP	2313*1	0.1mm		Outer	Diff	100ohm	5/8mil
L2		0.0175mm	0.6mm (inc copper)	Outer	Diff	90ohm	6/8mil
Core	FR4*1	0.565mm		Inner	Single	50ohm	21mil
L3		0.0175mm		Inner	Diff	100ohm	9/8mil
PP	2116*1	0.127mm		Inner	Diff	90ohm	12/8mil
L4		0.0175mm	0.6mm (inc copper)				
Core	FR4*1	0.565mm		Inner			
L5		0.0175mm					
PP	2313*1	0.1mm					
L6		0.035mm					
	Finished	1.6mm					

6 layer 2.0mm 2313PP

Layer	Type	Thickness		Trace layer	Type	Value	Trace
L1		0.035mm		Outer	Single	50ohm	6mil
PP	2313*1	0.1mm		Outer	Diff	100ohm	5/8mil

L2		0.0175mm		Outer	Diff	90ohm	6/8mil
Core	FR4*1	0.665mm	0.7mm (inc copper)	Inner	Single	50ohm	25mil
L3		0.0175mm		Inner	Diff	100ohm	9/8mil
PP	7628*1	0.2mm		Inner	Diff	90ohm	12.5/8mil
L4		0.0175mm					
Core	FR4*1	0.665mm	0.7mm (inc copper)				
L5		0.0175mm					
PP	2313*1	0.1mm					
L6		0.035mm					
	Finished	2.0mm					

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