

Defined layer buildup / layout examples for impedance

All values given are average values based on our many years of experience and serve as a basic orientation.

The actual values depend on the individual PCB layout and the chosen manufacturing technology.

On request, we can manufacture your PCB with impedance control (+/- 10% or +/- 5%).

Specified prepreg thicknesses: after pressing, at approx. 80% copper utilisation on the inner layers.

4 layers 1.6mm: Type 4L-01

Only nominal values	Solder-Stop		
	Cu 18µm + plating	- TOP -	35µm
	2x Prepreg 1080		140µm ϵ_r : 4,00
	Cu	- IN2 -	35µm
	Core 1200µm		1200µm ϵ_r : 4,60
	Cu	- IN3 -	35µm
	2x Prepreg 1080		140µm ϵ_r : 4,00
	Cu 18µm + plating	- BOT -	35µm
	Solder-Stop		

Estimated final thickness (+/- 10%): **1.6mm**

4 layers 1.0mm: Type 4L-02

Only nominal values	Solder-Stop		
	Cu 18µm + plating	- TOP -	35µm
	2x Prepreg 2116		230µm ϵ_r : 4,25
	Cu	- IN2 -	35µm
	Core 400µm		400µm ϵ_r : 4,50
	Cu	- IN3 -	35µm
	2x Prepreg 2116		230µm ϵ_r : 4,25
	Cu 18µm + plating	- BOT -	35µm
	Solder-Stop		

Estimated final thickness (+/- 10%): **1.0mm**

Layout examples impedance

	Ohm	signal layer	reference layer	width space width
Single ended	50 Ω	TOP	IN2	245µm - -
Differential pairs	90 Ω	TOP	IN2	180µm 120µm 180µm
Differential pairs	100 Ω	TOP	IN2	120µm 115µm 120µm
Single ended	50 Ω	BOT	IN3	245µm - -
Differential pairs	90 Ω	BOT	IN3	180µm 120µm 180µm
Differential pairs	100 Ω	BOT	IN3	120µm 115µm 120µm

Loss Tangent / Dissipation factor (Df): ca. 0.02
Dielectric constant ϵ_r for 1x Prepreg 1080: 3.95

	Ohm	signal layer	reference layer	width space width
Single ended	50 Ω	TOP	IN2	395µm - -
Differential pairs	90 Ω	TOP	IN2	230µm 120µm 230µm
Differential pairs	100 Ω	TOP	IN2	180µm 130µm 180µm
Single ended	50 Ω	BOT	IN3	395µm - -
Differential pairs	90 Ω	BOT	IN3	230µm 120µm 230µm
Differential pairs	100 Ω	BOT	IN3	180µm 130µm 180µm

Loss Tangent / Dissipation factor (Df): ca. 0.02
Dielectric constant ϵ_r for 1x Prepreg 2116: 4.20

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6 layers 1.6mm: Type 6L-01

Only nominal values	Solder-Stop	
	Cu 18µm + plating	
	2x Prepreg 2116	
	Cu	
	Core 300µm	
	Cu	
	3x Prepreg 2116	
	Cu	
	Core 300µm	
	Cu	
	2x Prepreg 2116	
	Cu 18µm + plating	
	Solder-Stop	
	- TOP -	35µm
		230µm ϵ_r : 4,25
	- IN2 -	35µm
		300µm ϵ_r : 4,50
	- IN3 -	35µm
		340µm ϵ_r : 4,25
	- IN4 -	35µm
		300µm ϵ_r : 4,50
	- IN5 -	35µm
		230µm ϵ_r : 4,25
	- BOT -	35µm

Estimated final thickness (+/- 10%): **1.6mm**

Layout examples impedance

	Ohm	signal layer	reference layer	width space width
Single ended	50 Ω	TOP	IN2	395µm - -
Differential pairs	90 Ω	TOP	IN2	230µm 120µm 230µm
Differential pairs	100 Ω	TOP	IN2	180µm 130µm 180µm
Single ended	50 Ω	IN3	IN2/IN4	255µm - -
Differential pairs	90 Ω	IN3	IN2/IN4	160µm 145µm 160µm
Differential pairs	100 Ω	IN3	IN2/IN4	135µm 170µm 135µm
Single ended	50 Ω	IN3	IN2/IN5	320µm - -
Differential pairs	90 Ω	IN3	IN2/IN5	180µm 145µm 180µm
Differential pairs	100 Ω	IN3	IN2/IN5	165µm 195µm 165µm
Single ended	50 Ω	IN4	IN5/IN2	320µm - -
Differential pairs	90 Ω	IN4	IN5/IN2	180µm 145µm 180µm
Differential pairs	100 Ω	IN4	IN5/IN2	165µm 195µm 165µm
Single ended	50 Ω	IN4	IN5/IN3	255µm - -
Differential pairs	90 Ω	IN4	IN5/IN3	160µm 145µm 160µm
Differential pairs	100 Ω	IN4	IN5/IN3	135µm 170µm 135µm
Single ended	50 Ω	BOT	IN5	395µm - -
Differential pairs	90 Ω	BOT	IN5	230µm 120µm 230µm
Differential pairs	100 Ω	BOT	IN5	180µm 130µm 180µm

Loss Tangent / Dissipation factor (Df): ca. 0.02
Dielectric constant ϵ_r for 1x Prepreg 2116: 4.20

Defined layer buildup / layout examples for impedance

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On request, we can manufacture your PCB with impedance control (+/- 10% or +/- 5%).
Specified prepreg thicknesses: after pressing, at approx. 80% copper utilisation on the inner layers.

8 layers 1.7mm: Type 8L-01

Only nominal values	Solder-Stop	
	Cu 18µm + plating	
	2x Prepreg 1080	
	Cu	
	Core 200µm	
	Cu	
	1x Prepreg 1080	
	1x Prepreg 2116	
	1x Prepreg 1080	
	Cu	
	Core 200µm	
	Cu	
	1x Prepreg 1080	
	1x Prepreg 2116	
	1x Prepreg 1080	
	Cu	
	Core 200µm	
	Cu	
	2x Prepreg 1080	
	Cu 18µm + plating	
	Solder-Stop	
	- TOP -	35µm
		140µm ϵ_r : 4,00
	- IN2 -	35µm
		200µm ϵ_r : 4,40
	- IN3 -	35µm
		255µm ϵ_r : 4,10
	- IN4 -	35µm
		200µm ϵ_r : 4,40
	- IN5 -	35µm
		255µm ϵ_r : 4,10
	- IN6 -	35µm
		200µm ϵ_r : 4,40
	- IN7 -	35µm
		140µm ϵ_r : 4,00
	- BOT -	35µm

Estimated final thickness (+/- 10%): **1.7mm**

Layout examples impedance

	Ohm	signal layer	reference layer	width space width
Single ended	50 Ω	TOP	IN2	245µm - -
Differential pairs	90 Ω	TOP	IN2	180µm 120µm 180µm
Differential pairs	100 Ω	TOP	IN2	120µm 115µm 120µm
Single ended	50 Ω	IN3	IN2/IN4	175µm - -
Differential pairs	90 Ω	IN3	IN2/IN4	110µm 110µm 110µm
Single ended	50 Ω	IN3	IN2/IN5	210µm - -
Differential pairs	90 Ω	IN3	IN2/IN5	125µm 115µm 125µm
Differential pairs	90 Ω	IN4	IN3/IN6	160µm 130µm 160µm
Differential pairs	100 Ω	IN4	IN3/IN6	115µm 135µm 115µm
Single ended	50 Ω	IN4	IN3/IN6	270µm - -
Single ended	50 Ω	IN5	IN3/IN6	270µm - -
Single ended	50 Ω	IN6	IN7/IN4	210µm - -
Differential pairs	90 Ω	IN6	IN7/IN4	125µm 115µm 125µm
Single ended	50 Ω	IN6	IN7/IN5	175µm - -
Differential pairs	90 Ω	IN6	IN7/IN5	110µm 110µm 110µm
Single ended	50 Ω	BOT	IN7	245µm - -
Differential pairs	90 Ω	BOT	IN7	180µm 120µm 180µm
Differential pairs	100 Ω	BOT	IN7	120µm 115µm 120µm

Loss Tangent / Dissipation factor (Df): ca. 0.02

Dielectric constant ϵ_r for 1x Prepreg 2116: 4.20 | Dielectric constant ϵ_r for 1x Prepreg 1080: 3.95