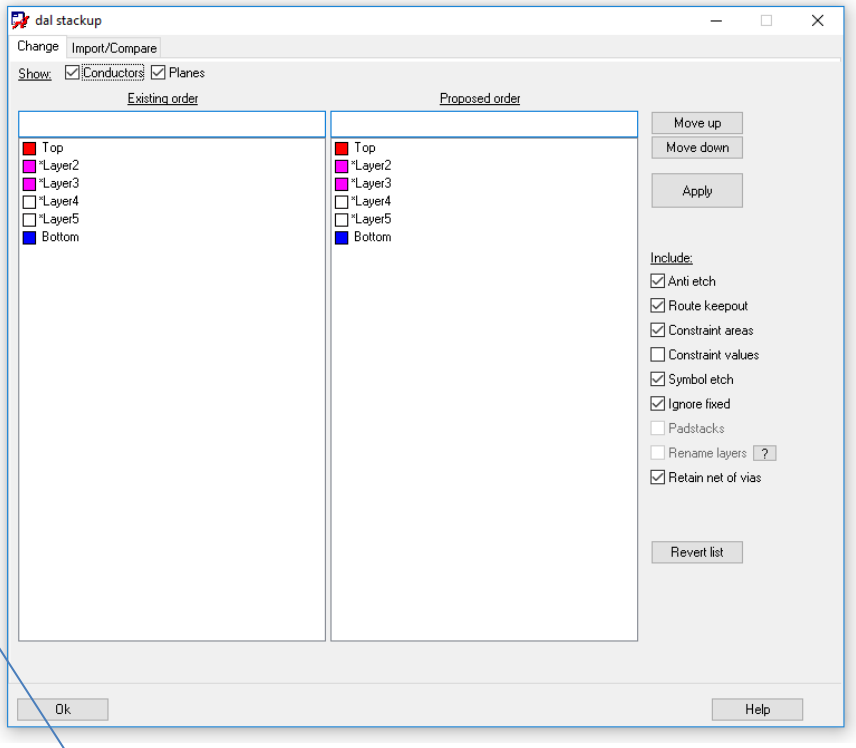
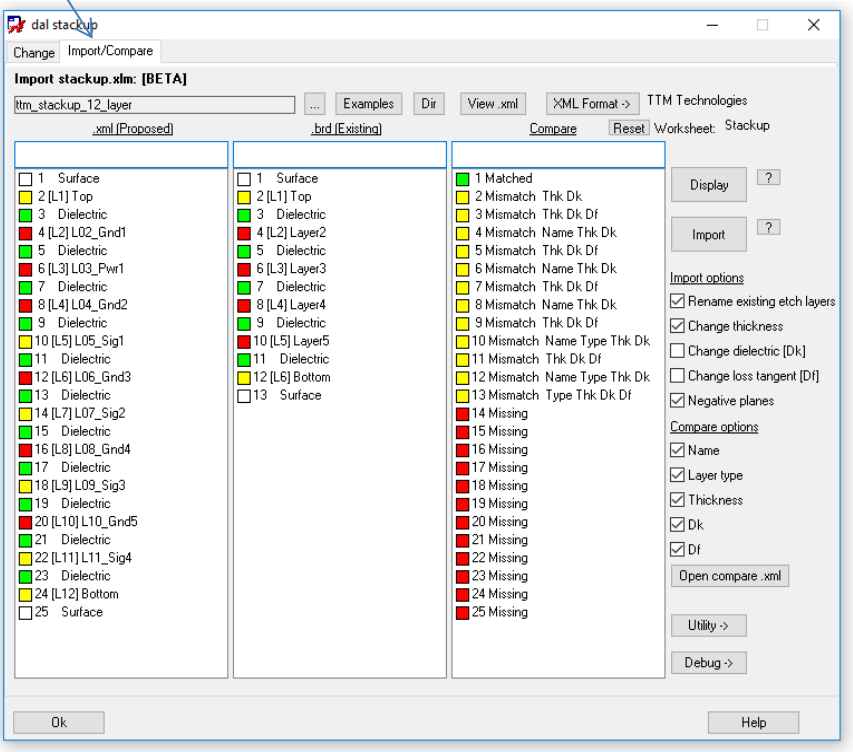
Stackup

Facilitates the quick and easy swapping of entire layers in the stackup. Also imports and verifies the entire stackup data from fabricator provided .xml spreadsheets. Layer names, types, thickness, material, dk, df, impedance widths/gaps, etc.

Features:

- Simple and easy to use interface.
- Eliminates the complicated and error prone method of changing graphics and layer order in the stackup.
- Saves hours of tedious and error prone work inputing and checking the information from the fabricator provided stackup data.





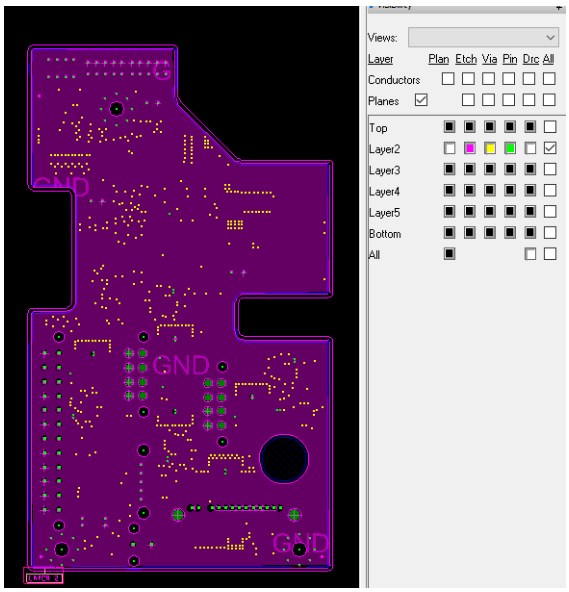
Video demonstration available at:

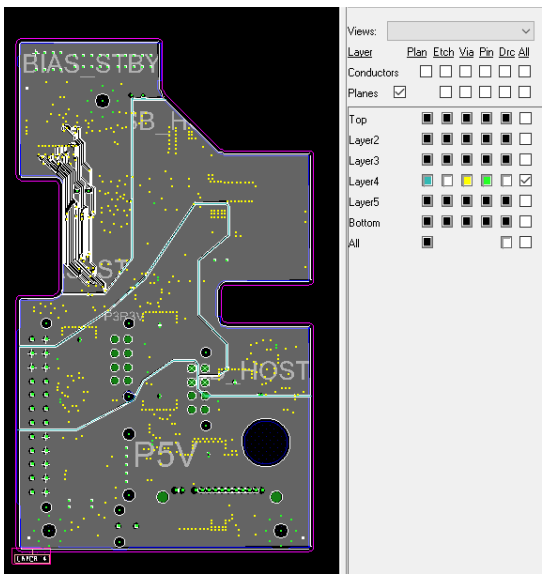
www.dalTools.com

Layer Swap Example

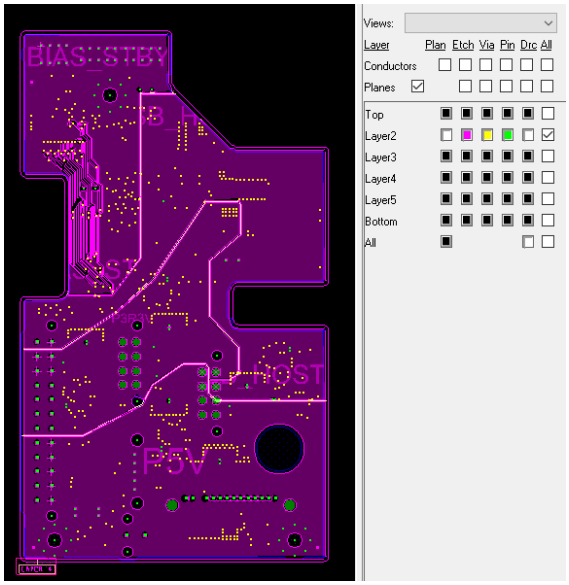
All cline, line, shape and text graphics are swapped automatically in the stackup in one simple step.

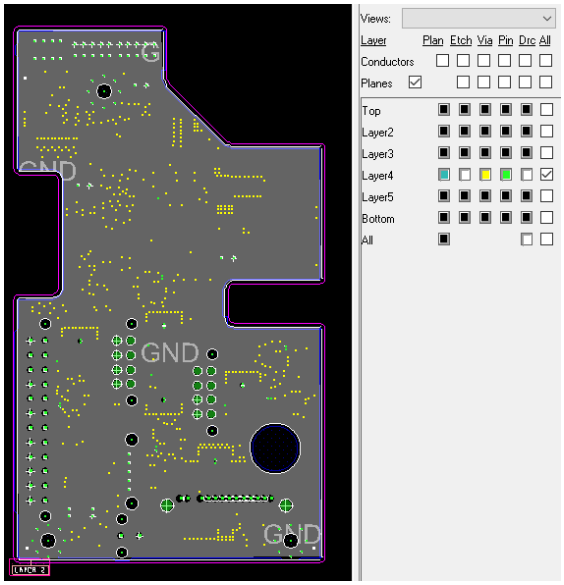
Before

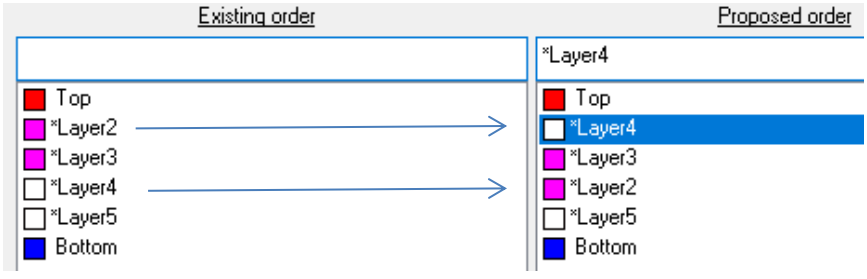




After







Stackup Import Example (Auto import and verify)

Layer		Copper Weight	Thickness (mil)	Structure figure	Proposed Thickness (mil)	Structure	Foil type	Reference Layer	Dk	Df	Single End 50ohm ±4ohm: Customer Design LW(mil)	Single End 50ohm ±4ohm: Calculated LW(mil)	Single End 50ohm ±4ohm: Calculated IMP(ohm)	Single End 55ohm ±4.4ohm: Customer Design LW(mil)	Single End 55ohm ±4.4ohm: Calculated LW(mil)	Single End 55ohm ±4.4ohm: Calculated IMP(ohm)	Differential 90ohm ±7.0ohm: Customer Design LW/SP(mil)	Differential 90ohm ±7.0ohm: Calculated LW/SP(mil)	Differential 90ohm ±7.0ohm: Calculated IMP(ohm)	Differential 100ohm ±8.2ohm: Customer Design LW/SP(mil)	Differential 100ohm ±8.2ohm: Calculated LW/SP(mil)	Differential 100ohm ±8.2ohm: Calculated IMP(ohm)
	Top Soldermask				0.60																	
L1	101_top.art	0.5oz+Plate			1.97	1/3oz+Plate	H T E+PL.	L2			6.00	7.90	50.00	4.88	6.40	55.00	6.25/9.75	7.7/8.3	90.00	4.00/5.50	4.5/5.0	100.00
								L2												3.50/4.30	3.7/4.1	100.00
								L2												5.00/6.80	5.3/6.5	100.00
								L2												5.00/10.00	6.2/8.8	100.00
								L2												6.00/10.50	6.5/10.0	100.00
	Prepreg				4.12	R5670K_1035*2 RC70			3.05	0.002												
L2	102_gnd1.art	2oz			2.50		RTF															
	Core				3.94	R1755V_106*2 RC71			3.68	0.019												
L3	103_pwr1.art	2oz			2.50		RTF															
	Prepreg				4.12	R5670K_1035*2 RC70			3.05	0.002												
L4	14_bottom.art	0.5oz+Plate			1.97	1/3oz+Plate	H T E+PL.	L3			6.00	7.90	50.00	4.88	6.40	55.00	6.25/9.75	7.7/8.3	90.00	4.00/5.50	4.5/5.0	100.00
								L3												6.00/10.50	6.5/10.0	100.00
								L3												5.00/10.00	6.2/8.8	100.00
								L3												5.00/6.80	5.3/6.5	100.00
								L3												3.50/4.30	3.7/4.1	100.00
	Bottom Soldermask				0.60																	
Overall	Thickness (mil)				22.31																	

Fab vendor provided data

Report

dal stackup

Swap | Import/Compare

Import stackup.xlm: [BETA]

ttm_stackup_4_layer | ... | Examples | Dir | View .xml | XML Format -> | TTM

.xml (Proposed)	.brd (Existing)	Compare	Reset	W
1 Surface	1 Surface	1 Matched		
2 [L1] Top	2 [L1] Top	2 Mismatch Thk		
3 Dielectric	3 Dielectric	3 Mismatch Thk		
4 [L2] L02_Gnd1	4 [L2] Old Layer 2	4 Mismatch Name Type Thk		
5 Dielectric	5 Dielectric	5 Mismatch Thk		
6 [L3] L03_Pwr1	6 [L3] Old Layer 3	6 Mismatch Name Thk		
7 Dielectric	7 Dielectric	7 Mismatch Thk		
8 [L4] Bottom	8 [L4] Bottom	8 Mismatch Thk		
9 Surface	9 Surface	9 Matched		

Before

Layout Cross Section

	Subclass Name	Type	Thickness (MIL)	Dielectric Constant	Loss Tangent
1		SURFACE		1	0
2	TOP	CONDUCTOR	4.12	3.05	0.002
3		DIELECTRIC	8	4.5	0.035
4	OLD LAYER 2	CONDUCTOR	3.94	3.68	0.019
5		DIELECTRIC	8	4.5	0.035
6	OLD LAYER 3	PLANE	1.2	4.5	0.035
7		DIELECTRIC	8	4.5	0.035
8	BOTTOM	CONDUCTOR	1.2	1	0
9		SURFACE		1	0

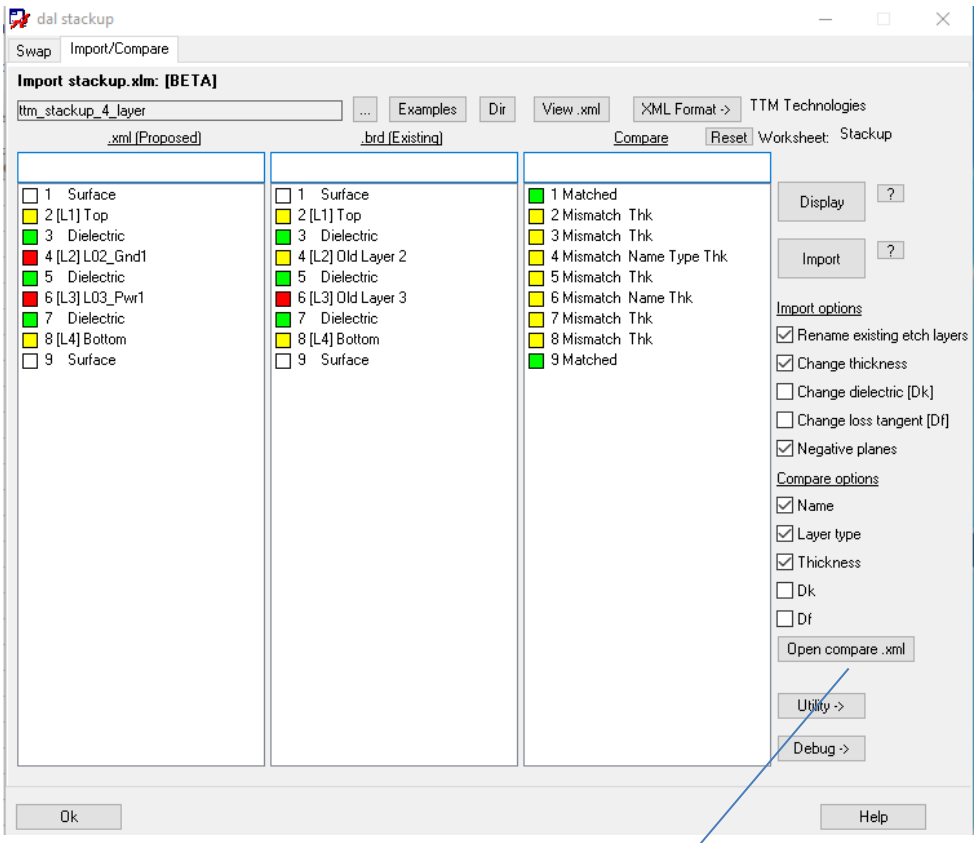
ALL information is automatically inserted or checked.

After

Layout Cross Section

	Subclass Name	Type	Thickness (MIL)	Dielectric Constant	Loss Tangent
1		SURFACE		1	0
2	TOP	CONDUCTOR	1.97	3.05	0.002
3		DIELECTRIC	4.12	4.5	0.035
4	L02_GND1	CONDUCTOR	2.5	3.68	0.019
5		DIELECTRIC	3.94	4.5	0.035
6	L03_PWR1	PLANE	2.5	4.5	0.035
7		DIELECTRIC	4.12	4.5	0.035
8	BOTTOM	CONDUCTOR	1.97	1	0
9		SURFACE		1	0

Detailed Stackup Difference Report

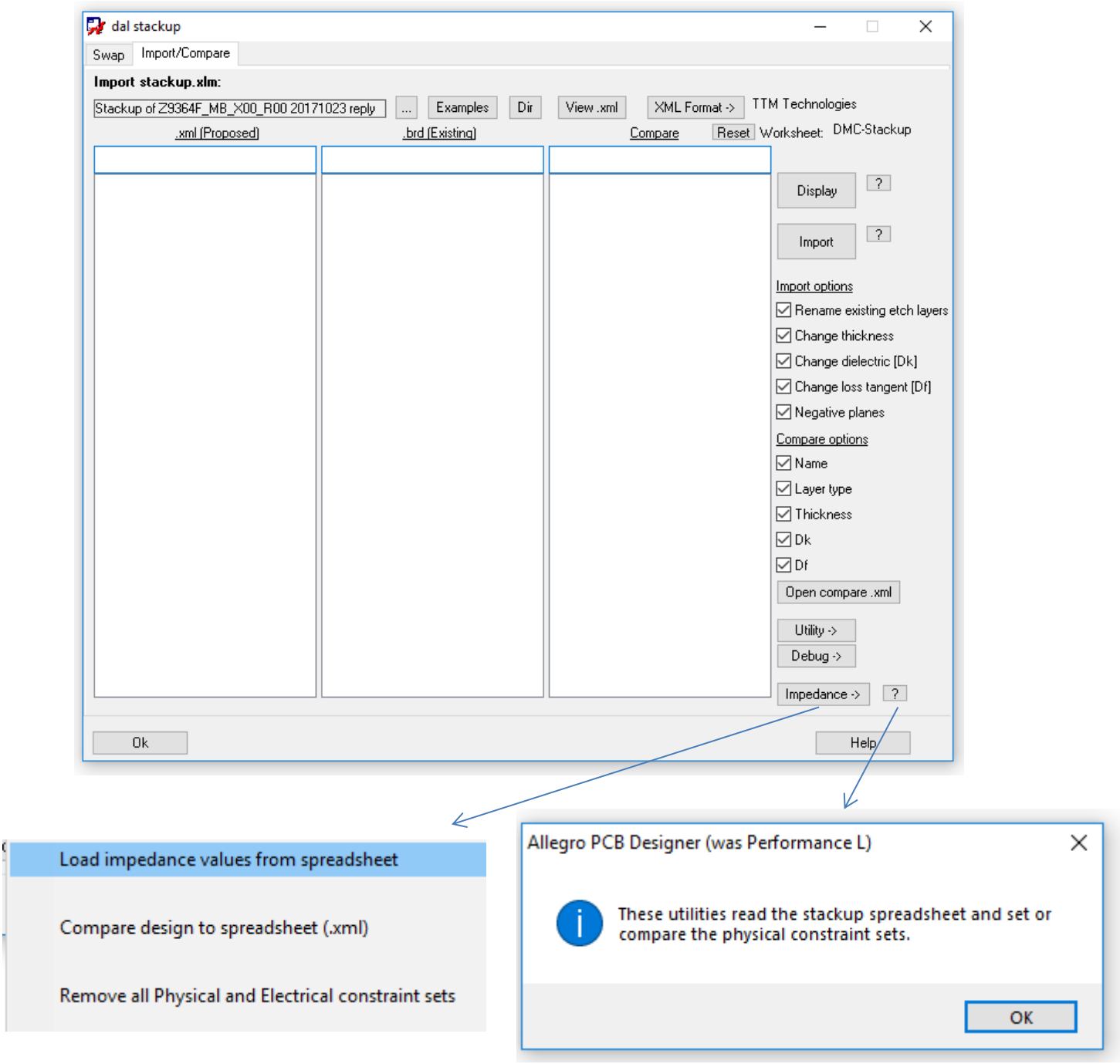


	A	B	C	D
1	Num	Name	Type	Thk
2	1		SURFACE	0.0
3	2	TOP	CONDUCTOR	4.12 -> 1.97
4	3		DIELECTRIC	8.0 -> 4.12
5	4	OLD LAYER 2 -> L02_GND1	CONDUCTOR -> PLANE	3.94 -> 2.5
6	5		DIELECTRIC	8.0 -> 3.94
7	6	OLD LAYER 3 -> L03_PWR1	PLANE	1.2 -> 2.5
8	7		DIELECTRIC	8.0 -> 4.12
9	8	BOTTOM	CONDUCTOR	1.2 -> 1.97
10	9		SURFACE	0.0
11				

Green indicates match

Yellow indicates difference

Auto Impedance Physical Constraint Set Import -> Name, Layer, Width/Spacing Values



Sample Input .xml file

			Customer Stack-up		Stack-up Information						Single End 50ohm ±4ohm			Single End 55ohm ±4.4ohm			Differential 90ohm ±7.0ohm			Differential 100ohm ±8.2ohm		
Layer		Copper Weight	Thickness (mil)	Structure figure	Proposed Thickness (mil)	Structure	Foil type	Reference Layer	Dk	Df	Customer Design LW(mil)	Calculated LW(mil)	Calculated IMP(ohm)	Customer Design LW(mil)	Calculated LW(mil)	Calculated IMP(ohm)	Customer Design LW/SP(mil)	Calculated LW/SP(mil)	Calculated IMP(ohm)	Customer Design LW/SP(mil)	Calculated LW/SP(mil)	Calculated IMP(ohm)
	Top Soldermask				0.60																	
L1	101_top.art	0.5oz+Plate			1.97	1/3oz+Plate	H T E-PL.	L2			6.00	7.90	50.00	4.88	6.40	55.00	6.25/9.75	7.7/8.3	90.00	4.00/5.50	4.5/5.0	100.00
								L2												3.50/4.30	3.7/4.1	100.00
								L2												5.00/6.80	5.3/6.5	100.00
								L2												5.00/10.00	6.2/8.8	100.00
								L2												6.00/10.50	6.5/10.0	100.00
	Prepreg				4.12	R5670K_1035*2 RC70			3.05	0.002												
L2	102_gnd1.art	2oz			2.50		RTF															
	Core				3.94	R1755V_106*2 RC71			3.68	0.019												
L3	103_pwr1.art	2oz			2.50		RTF															
	Prepreg				3.54	R1650V_106 *2 RC72			3.66	0.019												
L4	104_gnd2.art	0.5oz			0.60		HVLP															
	Core				5.91	R5775K_1078*2 RC63			3.14	0.002												
L5	105_sig1.art	0.5oz			0.60		HVLP	L6/L4			7.00	7.00	50.00	5.88	5.80	55.00	6.25/4.25	6.3/4.2	90.00	4.00/3.25	4.1/3.2	100.00
								L6/L4												5.00/4.40	5.0/4.4	100.00
								L6/L4												6.00/6.90	6.0/6.9	100.00
	Prepreg				6.47	R5670K_1078*2 RC68			3.07	0.002												
L6	106_gnd3.art	0.5oz			0.60		HVLP															

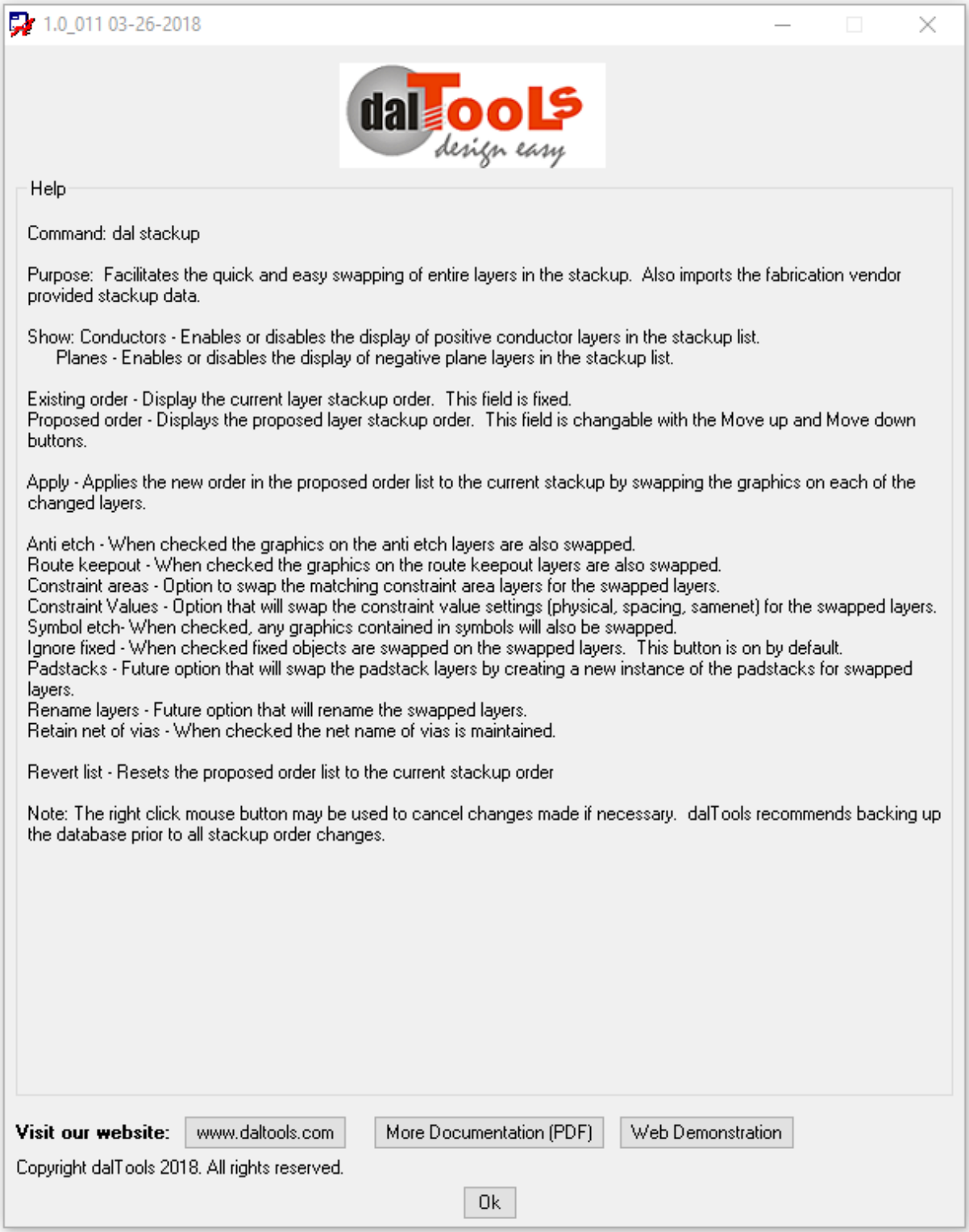
Single End 55ohm ±4.4ohm			Differential 90ohm ±7.0ohm		
Customer Design LW(mil)	Calculated LW(mil)	Calculated IMP(ohm)	Customer Design LW/SP(mil)	Calculated LW/SP(mil)	Calculated IMP(ohm)
4.88	6.40	55.00	6.25/9.75	7.7/8.3	90.00
5.88	5.80	55.00	6.25/4.25	6.3/4.2	90.00

This data is loaded automatically into ***physical constraint*** sets saving hours of time. It may also be used to verify that all the information matches at any time.

Constraint Manager After Auto Import

	Objects			Line Width		Neck			
1				Min	Max	Min Width	Max Length	Min Line Spac	Primary Gap
2	Type	S	Name	mil	mil	mil	mil	mil	mil
*	*		*	*	*	*	*	*	*
4	Dsn		⊟ blank16_6	5.00	0.00	5.00	0.00	0.00	0.00
5	PCS		⊞ DEFAULT	5.00	0.00	5.00	0.00	0.00	0.00
6	PCS		⊞ 50_OHM_SE	7.90:0.00:0...	7.90:0.00:0...	5.00	0.00	0.00	0.00
19	PCS		⊟ 55_OHM_SE	6.40:0.00:0...	6.40:0.00:0...	5.00	0.00	0.00	0.00
20	Lyr		TOP	6.40	6.40	5.00	0.00	0.00	0.00
21	Lyr		L02_GND1	0.00	0.00	5.00	0.00	0.00	0.00
22	Lyr		L03_PWR1	0.00	0.00	5.00	0.00	0.00	0.00
23	Lyr		L04_GND2	0.00	0.00	5.00	0.00	0.00	0.00
24	Lyr		L05_SIG1	5.80	5.80	5.00	0.00	0.00	0.00
25	Lyr		L06_GND3	0.00	0.00	5.00	0.00	0.00	0.00
26	Lyr		L07_SIG2	5.80	5.80	5.00	0.00	0.00	0.00
27	Lyr		L08_GND4	0.00	0.00	5.00	0.00	0.00	0.00
28	Lyr		L09_SIG3	5.80	5.80	5.00	0.00	0.00	0.00
29	Lyr		L10_GND5	0.00	0.00	5.00	0.00	0.00	0.00
30	Lyr		L11_SIG4	5.80	5.80	5.00	0.00	0.00	0.00
31	Lyr		BOTTOM	6.40	6.40	5.00	0.00	0.00	0.00
32	PCS		⊟ 90_OHM_DIFF	7.70:0.00:0...	7.70:0.00:0...	5.00	0.00	0.00	8.30:0.00:0...
33	Lyr		TOP	7.70	7.70	5.00	0.00	0.00	8.30
34	Lyr		L02_GND1	0.00	0.00	5.00	0.00	0.00	0.00
35	Lyr		L03_PWR1	0.00	0.00	5.00	0.00	0.00	0.00
36	Lyr		L04_GND2	0.00	0.00	5.00	0.00	0.00	0.00
37	Lyr		L05_SIG1	6.30	6.30	5.00	0.00	0.00	4.20
38	Lyr		L06_GND3	0.00	0.00	5.00	0.00	0.00	0.00
39	Lyr		L07_SIG2	6.30	6.30	5.00	0.00	0.00	4.20
40	Lyr		L08_GND4	0.00	0.00	5.00	0.00	0.00	0.00
41	Lyr		L09_SIG3	6.30	6.30	5.00	0.00	0.00	4.20
42	Lyr		L10_GND5	0.00	0.00	5.00	0.00	0.00	0.00
43	Lyr		L11_SIG4	6.30	6.30	5.00	0.00	0.00	4.20
44	Lyr		BOTTOM	7.70	7.70	5.00	0.00	0.00	8.30

Help


1.0_011 03-26-2018
dalTools
design easy
Help
Command: dal stackup
Purpose: Facilitates the quick and easy swapping of entire layers in the stackup. Also imports the fabrication vendor provided stackup data.
Show: Conductors - Enables or disables the display of positive conductor layers in the stackup list.
Planes - Enables or disables the display of negative plane layers in the stackup list.
Existing order - Display the current layer stackup order. This field is fixed.
Proposed order - Displays the proposed layer stackup order. This field is changable with the Move up and Move down buttons.
Apply - Applies the new order in the proposed order list to the current stackup by swapping the graphics on each of the changed layers.
Anti etch - When checked the graphics on the anti etch layers are also swapped.
Route keepout - When checked the graphics on the route keepout layers are also swapped.
Constraint areas - Option to swap the matching constraint area layers for the swapped layers.
Constraint Values - Option that will swap the constraint value settings (physical, spacing, samenet) for the swapped layers.
Symbol etch- When checked, any graphics contained in symbols will also be swapped.
Ignore fixed - When checked fixed objects are swapped on the swapped layers. This button is on by default.
Padstacks - Future option that will swap the padstack layers by creating a new instance of the padstacks for swapped layers.
Rename layers - Future option that will rename the swapped layers.
Retain net of vias - When checked the net name of vias is maintained.
Revert list - Resets the proposed order list to the current stackup order
Note: The right click mouse button may be used to cancel changes made if necessary. dalTools recommends backing up the database prior to all stackup order changes.
Visit our website:
www.daltools.com
More Documentation (PDF)
Web Demonstration
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Ok