

Multi Board ?????

- Sheet - Hierarchical Design
 - Multi Channel
- Multi Board Design
- Embedded Board Array

Hierarchical Design

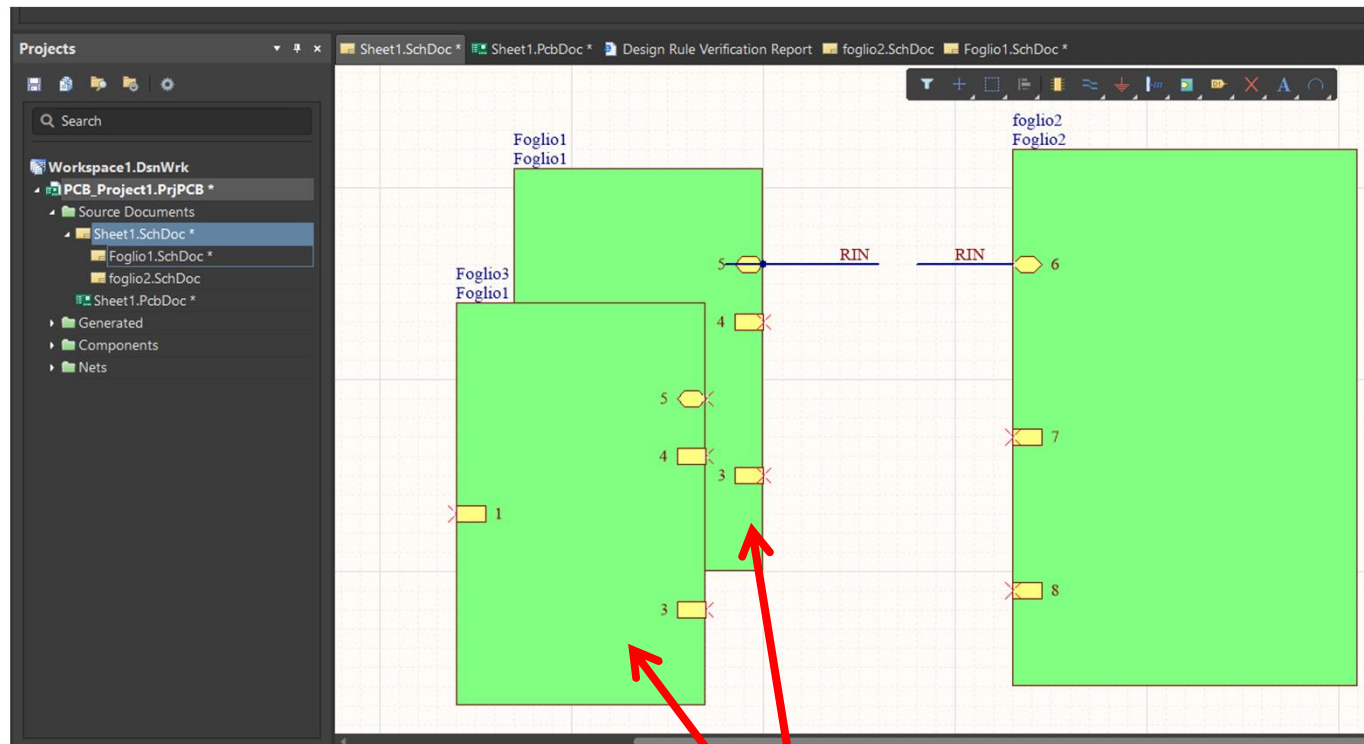
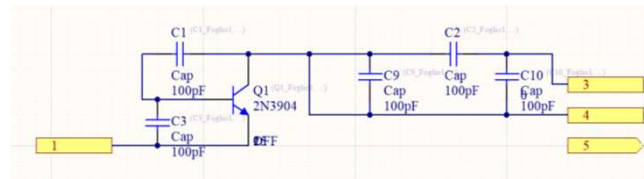
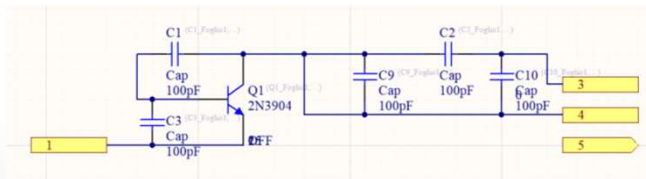
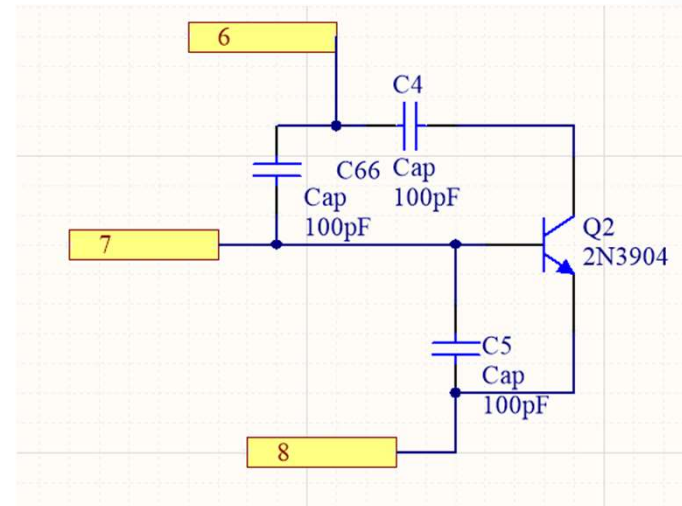
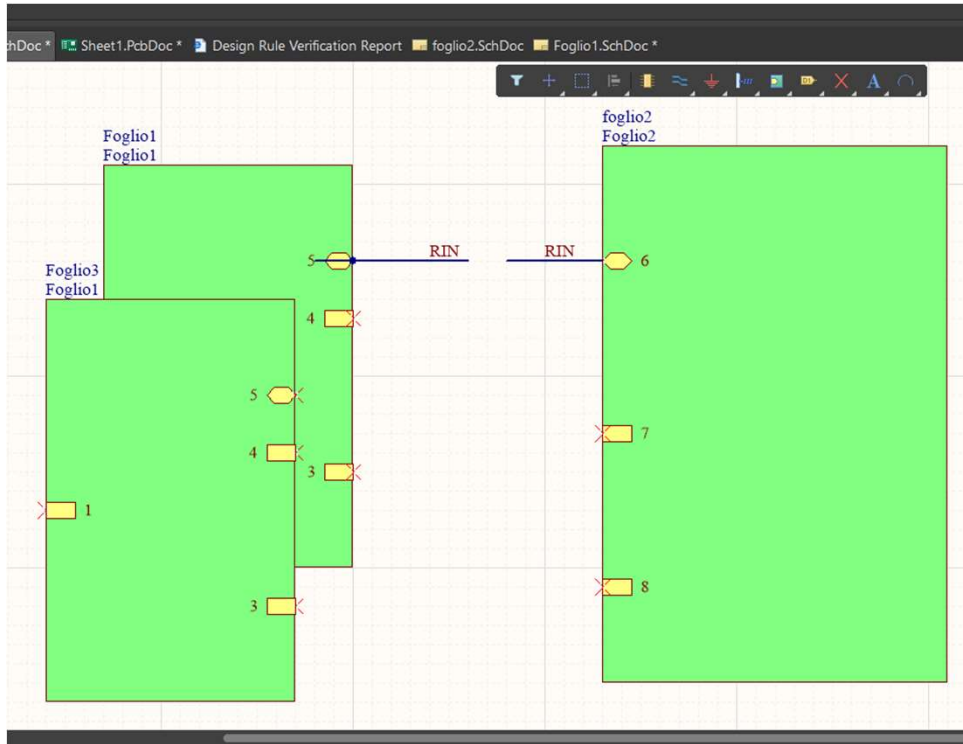
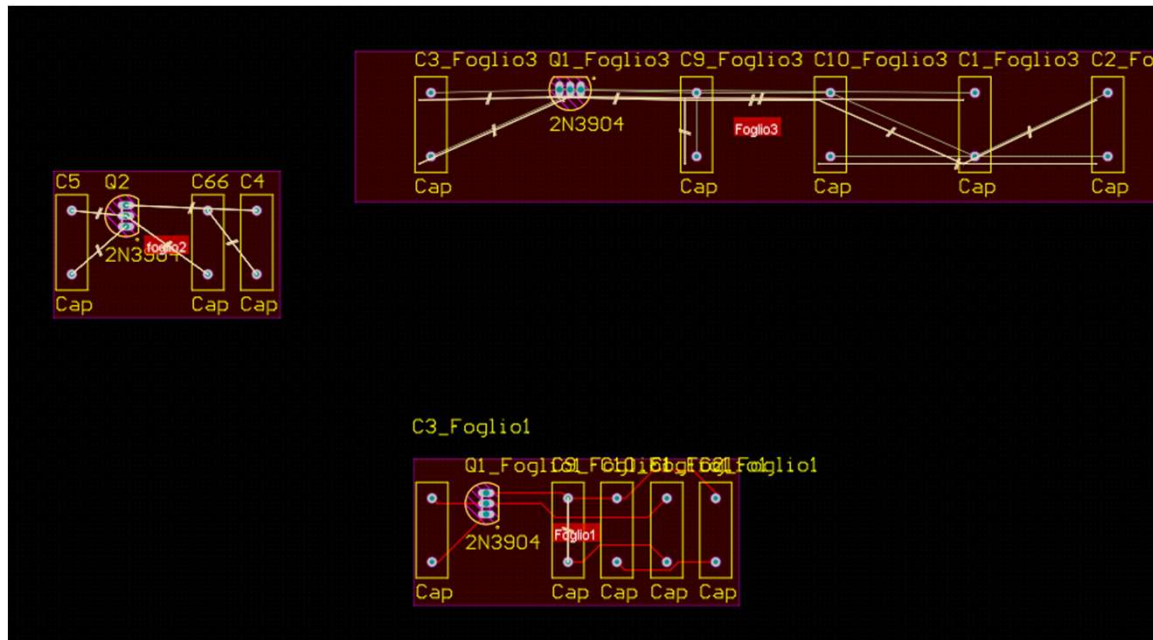


Diagramma a blocchi in cui posso inserire più copie dello stesso schematico

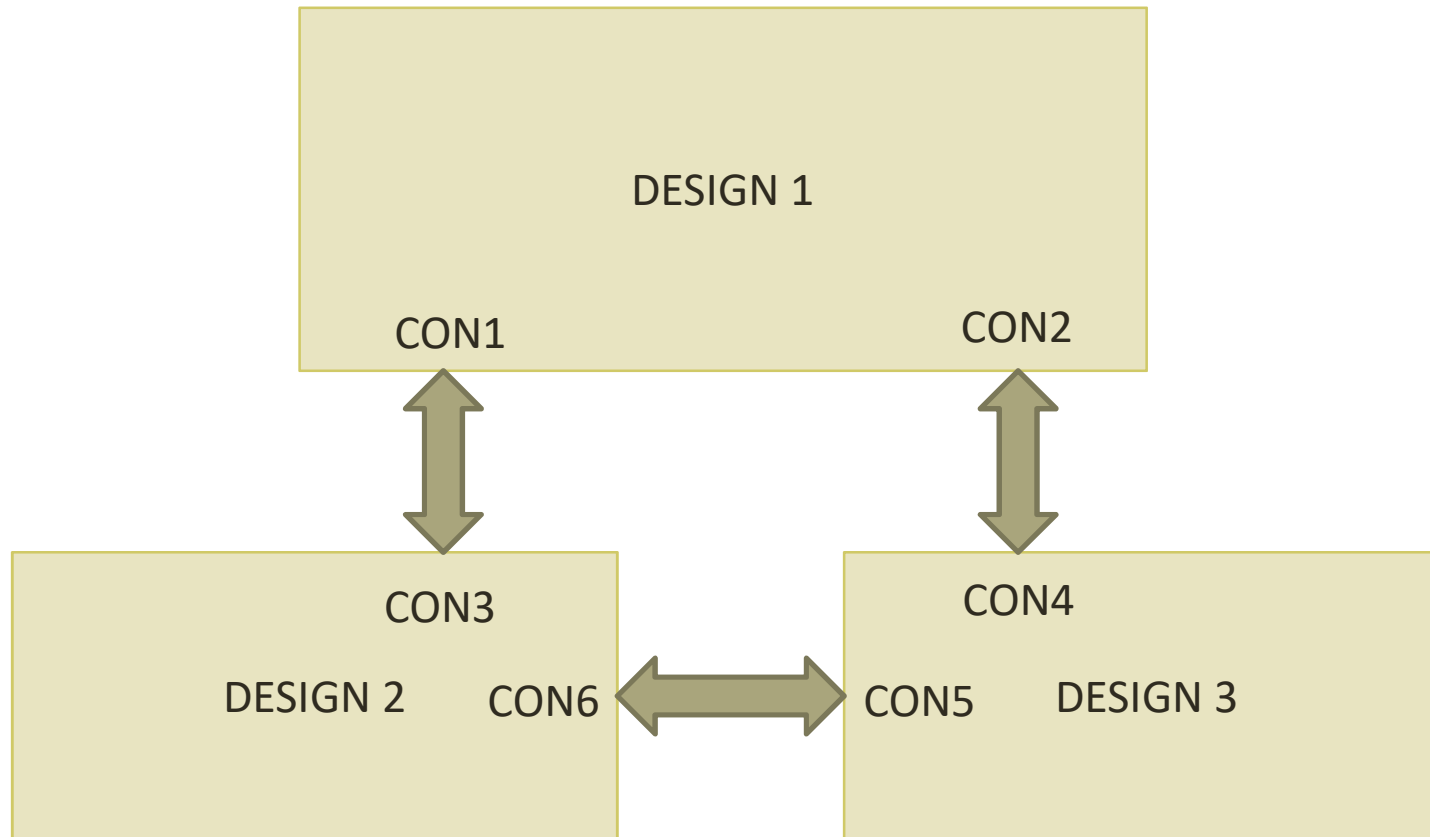
Hierarchical Design



Hierarchical Design



Multiboard Design



Multiboard Design

Lo schematico a blocchi, in cui ogni board è rappresentato da un PCB, permette di verificare la correttezza dei collegamenti.

Permette di verificare l'assemblaggio meccanico di più boards.

Di verificare la correttezza dei cavi di collegamento.

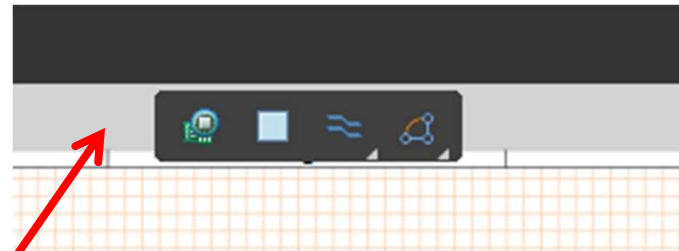
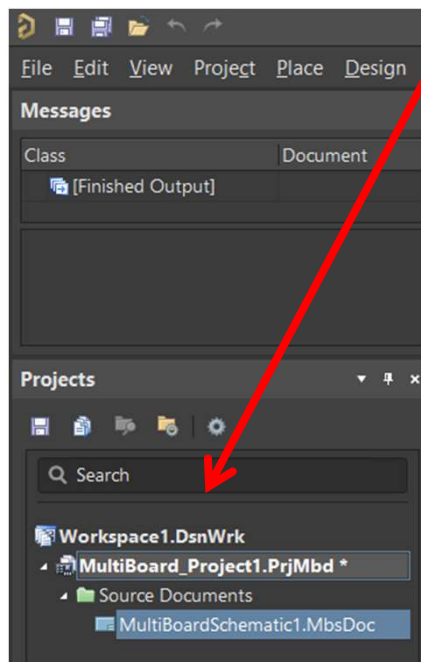
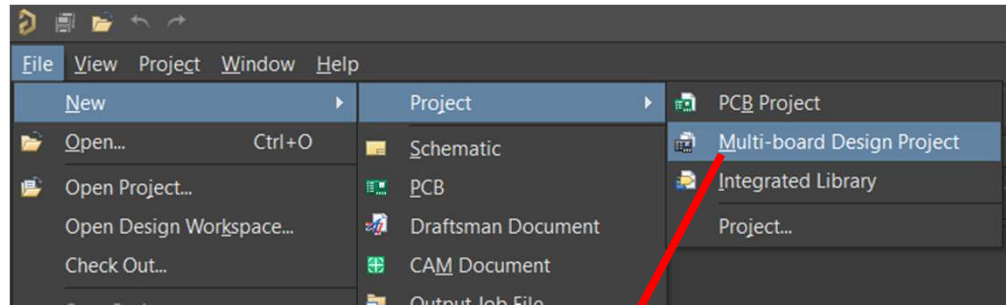
Il plug-in di boards che vanno inserite come componenti .

Si realizza attraverso un progetto dedicato alle Multi Board

Multiboard Design

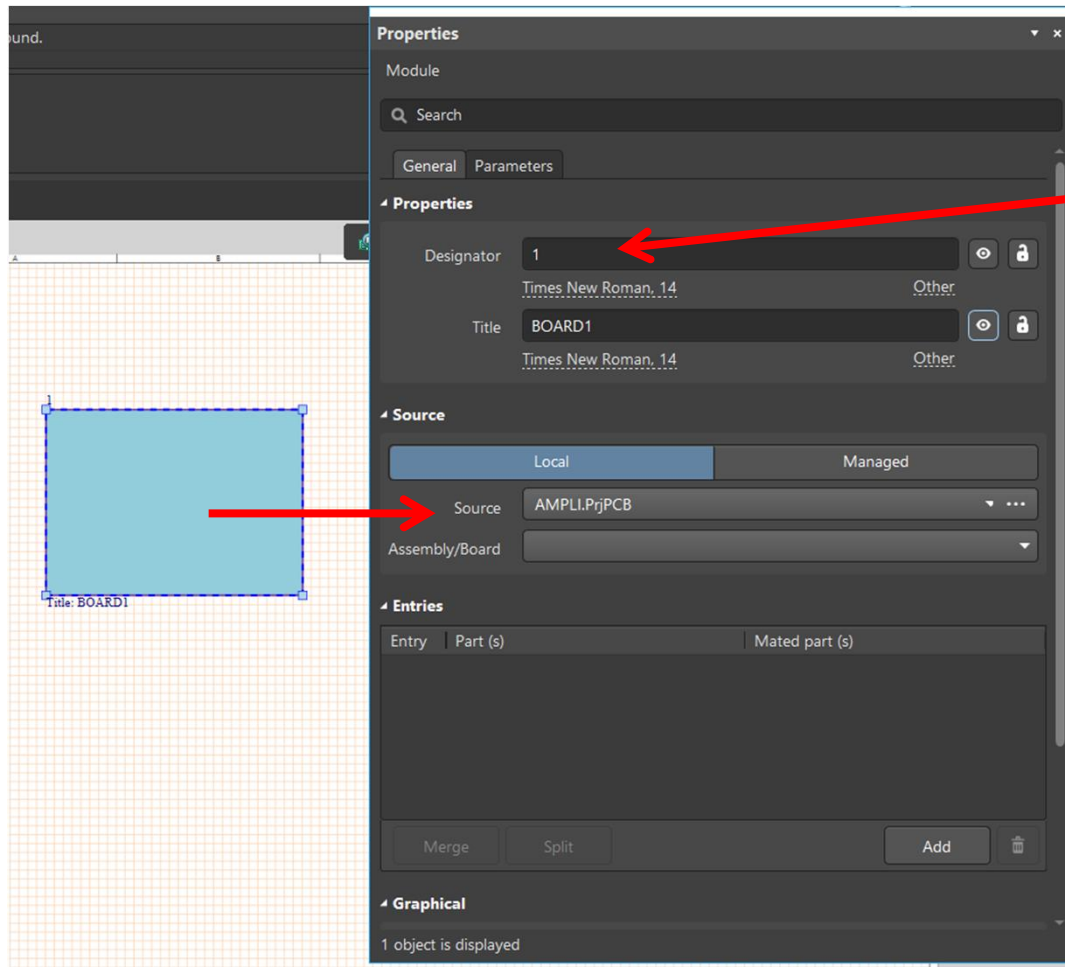
- Create an Altium Designer Multi-board project and add a Multi-board schematic document to the project.
- Place graphical blocks (Modules) in the Schematic to logically represent the child projects.
- Link each Module to its appropriate child project.
- Import the child project connectivity data into the system design.
- Add connections between Modules to create the logical system design.

Multiboard Design



Module
Entry
Cable
Graphics

Multiboard Design - Module

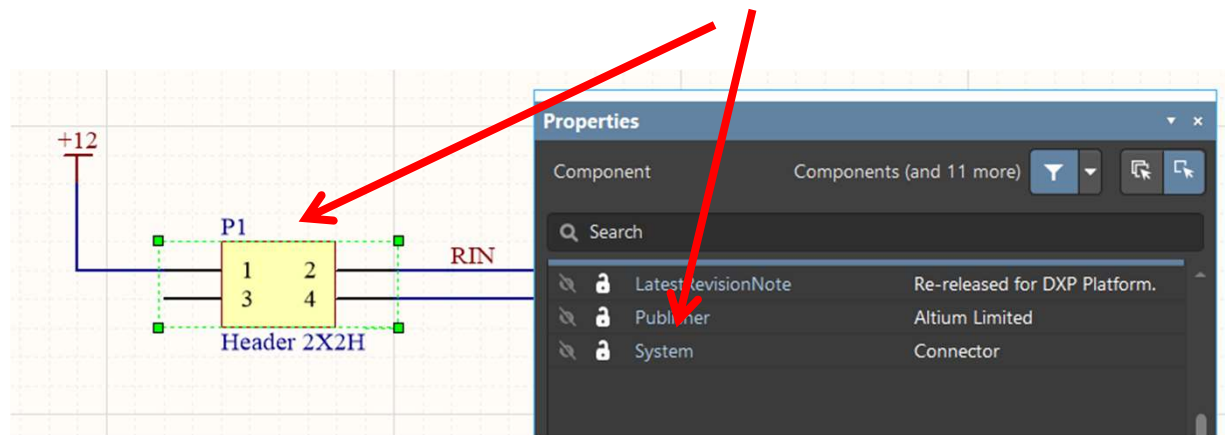


Stesse regole di uno schematico a livello superiore

Multiboard Design – Module Connector

In ogni schematico di origine occorre indicare quali connettori sono da rendere disponibili al livello superiore.

Nelle 'Properties' del componente occorre aggiungere il parametro System con valore Connector



Multiboard Design – Import from Child Project

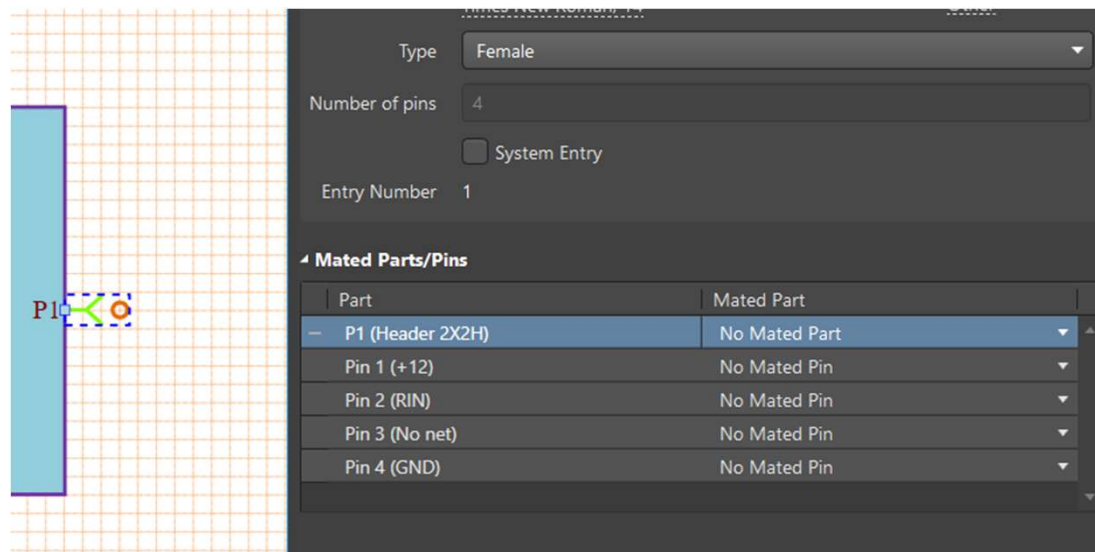
Il link fra il modulo e il progetto d'origine occorre effettuarlo attraverso l'importazione delle caratteristiche.

The image shows a workflow in Altium Designer for importing characteristics from a child project. On the left, the 'Design' menu is open, with 'Import From Selected Child Projects' highlighted. In the center, the 'Engineering Change Order' dialog box is displayed, showing a table of modifications. A red arrow points from the 'P1' entry in the table to a component labeled 'P1' on a PCB schematic. The schematic is titled 'BOARD3'.

Engineering Change Order				
Modifications				
Enable	Action	Affected Object	Affected Document	Status
				Check Done Message
<input checked="" type="checkbox"/>	Add	P1 to Module 1 (AMPLI.PrjPCB)	In MultiBoardSchematic1.MbsDoc (From	✓ ✓

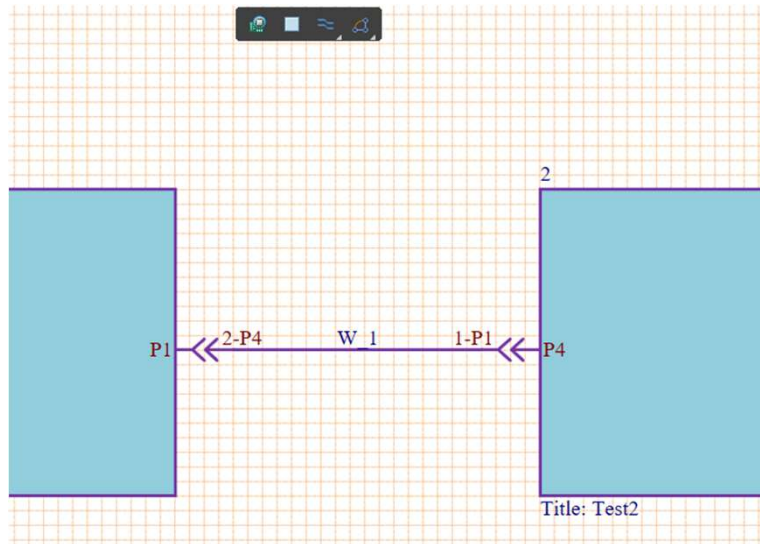
Multiboard Design

L'importazione delle caratteristiche mette a disposizione i parametri dei connettori che sono stati definiti per il livello superiore.



Fino a che il connettore non è connesso a un altro, i pin sono machiati come 'No MATED Pin'

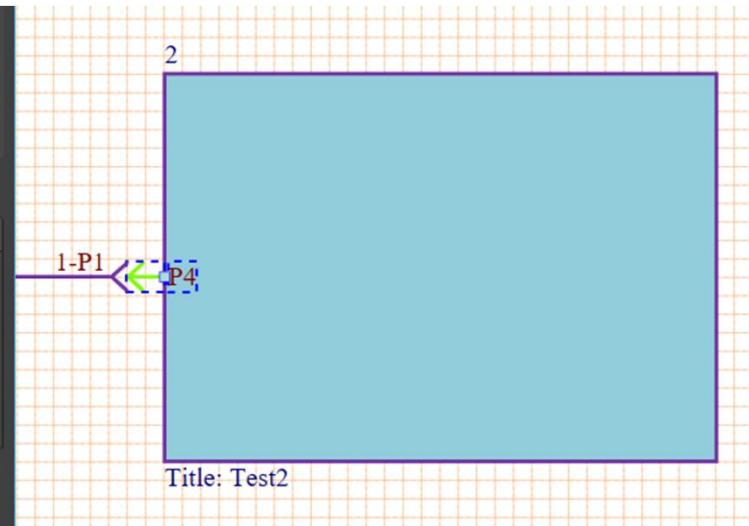
Multiboard Design



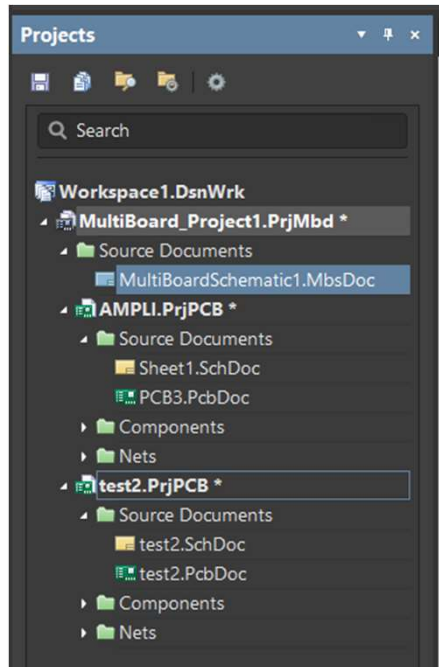
Number of pins 4
 System Entry
Entry Number 1

▲ Mated Parts/Pins

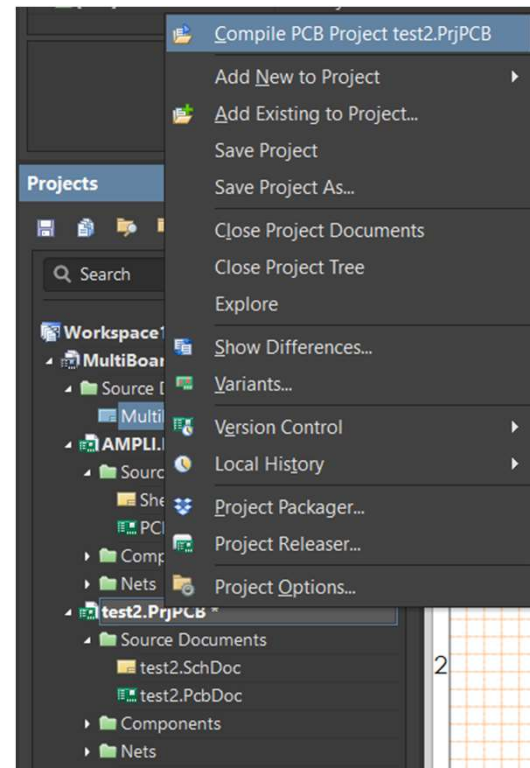
Part	Mated Part
P4 (Header 2X2)	Wires (W_1)
Pin 1 (+12)	W_1-W1
Pin 2 (RIN)	W_1-W2
Pin 3 (No net)	W_1-W3
Pin 4 (GND)	W_1-W4



Multiboard Design

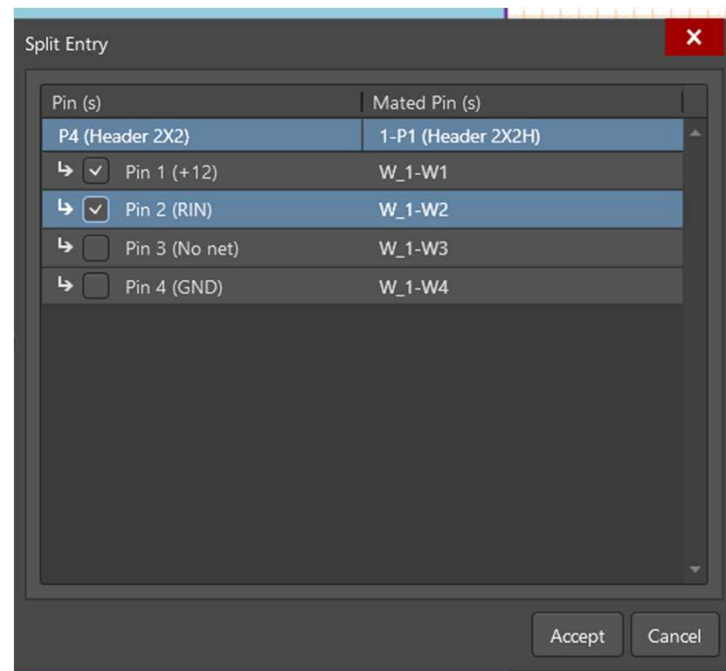
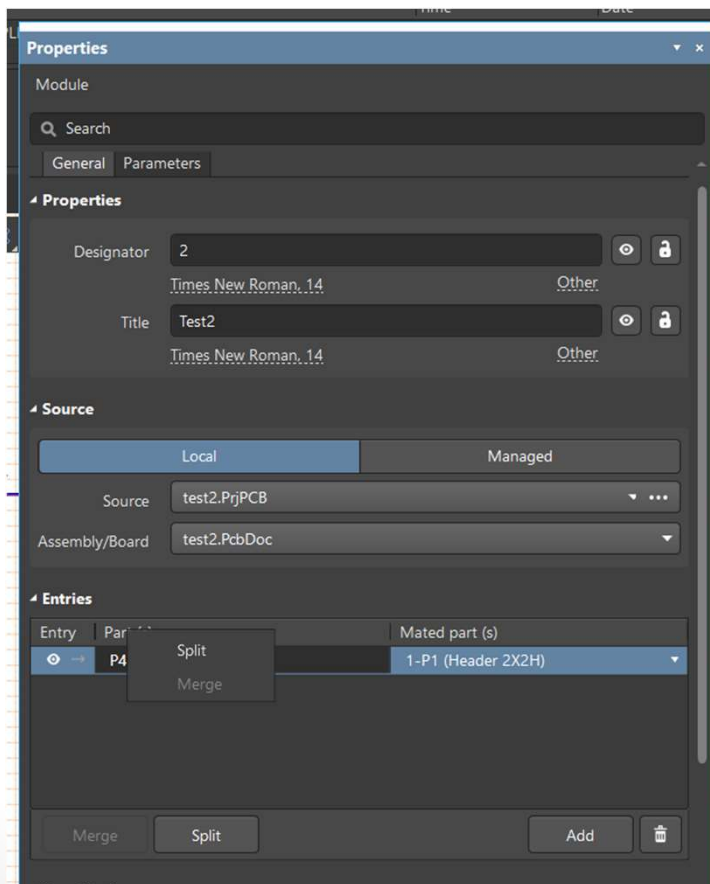


Nel Progetto vengono inseriti anche tutti i documenti dei progetti di origine.
Si possono compilare selezionando il nome e 'Compile.....'

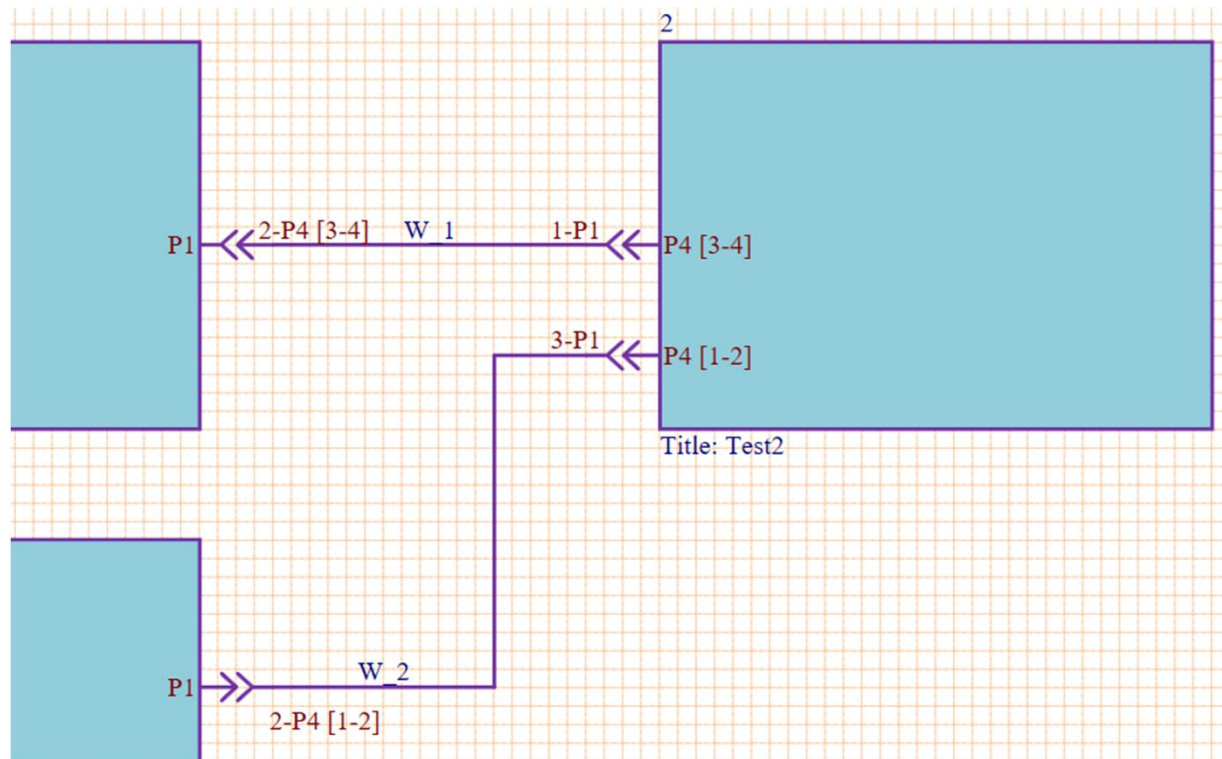


Multiboard Design – Split connection

Il connettore di una board può essere suddiviso in più collegamenti attraverso lo SPLIT. Divide il connettore ma non lo duplica.



Multiboard Design – Split connection



Multiboard Design – Cable

The screenshot displays the Altium Designer interface for a cable design. On the left, the Properties panel is open to the 'Cable' section. The 'Designator' is set to 'C_1', the font is 'Times New Roman, 14', and the 'Number Of Connections' is '2'. The 'Entries' table lists four connection points, and the 'Connections' table shows the specific net connections between them.

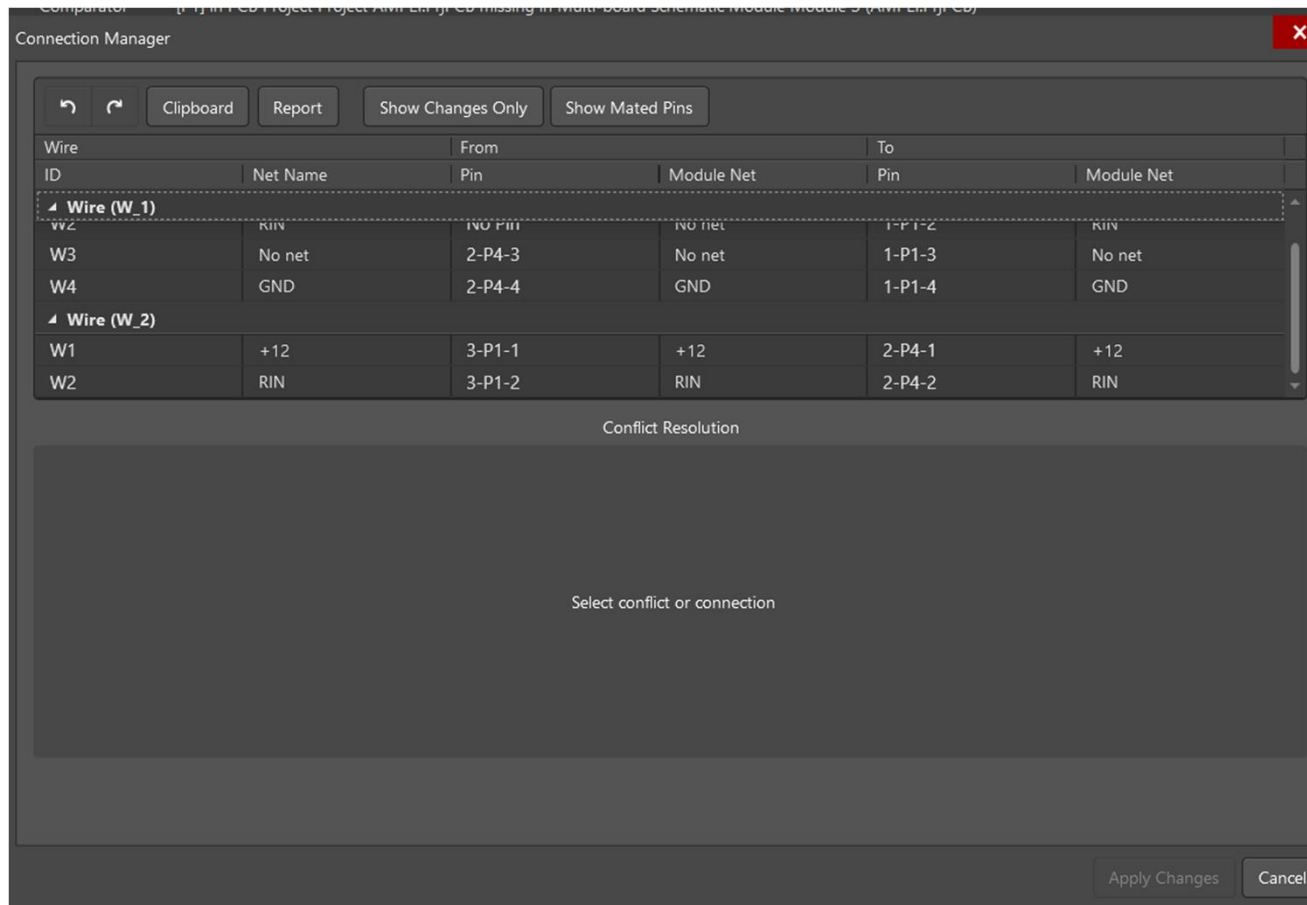
Entry	Designator	Part	Mated
→	Entry_1		1-P1 (Header 2X2H)
←	Entry_2		2-P4 (Header 2X2)
←	Entry_3		3-P1 (Header 2X2H)
←	Entry_4		2-P4 (Header 2X2)

#	Net	From	To
+ C_1.1	group	1-P1/C_1-Entry_1	2-P4 [3-4]/C_1-Entry_2
+ C_1.2	group	2-P4 [3-4]/C_1-Entry_2	3-P1/C_1-Entry_3
+ C_1.3	group	3-P1/C_1-Entry_3	2-P4 [1-2]/C_1-Entry_4

The schematic diagram on the right shows two blue rectangular components labeled 'P1' and '2'. A green line labeled 'Entry 2' connects the top of component '2' to the top of component 'P1'. A red line labeled 'Entry 4' connects the bottom of component '2' to the bottom of component 'P1'. A blue line labeled 'Entry 3' connects the bottom of component 'P1' to the bottom of component '2'. The text 'Title: Tes' is visible at the bottom right of the diagram.

Multiboard Design – Connection Manager

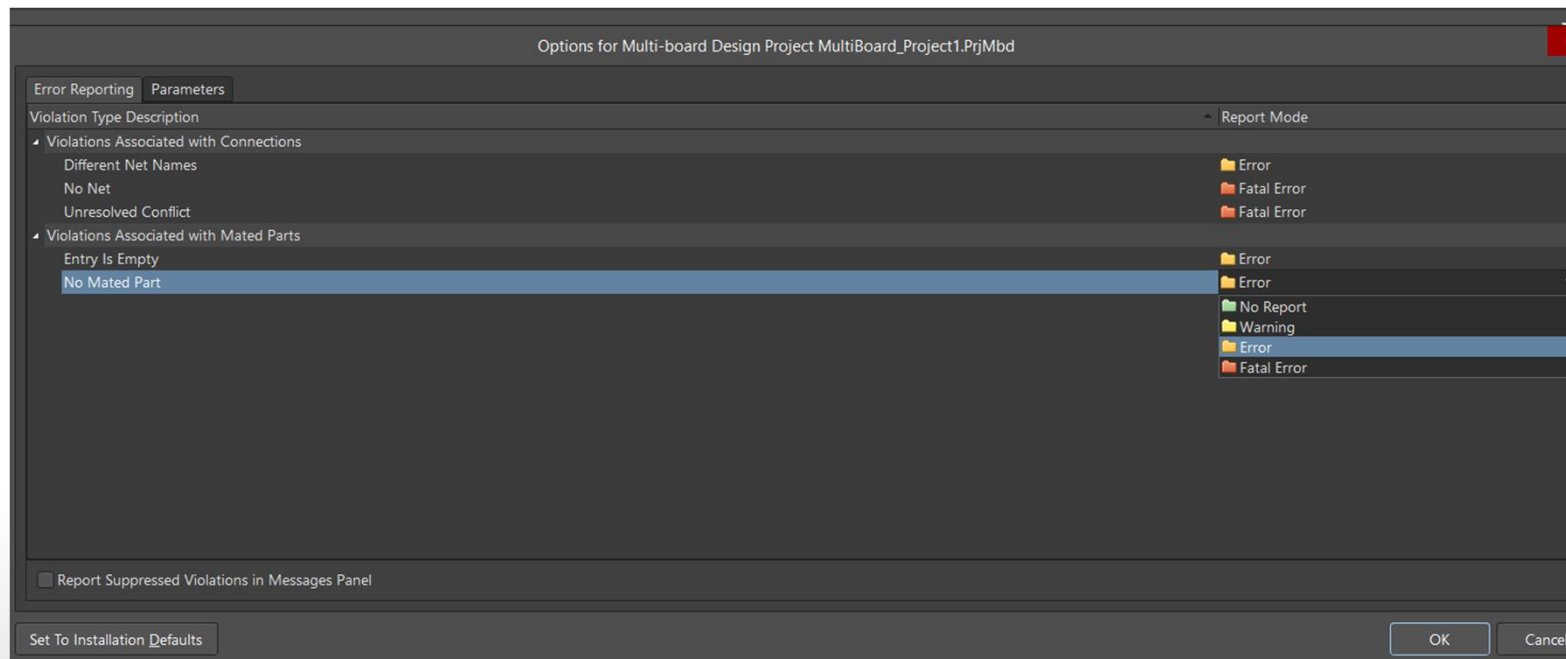
(da DESIGN) indica tutti i collegamenti fra i moduli.



Multiboard Design – ERC

Da Project Options posso definire quali sono i controlli fondamentali

04/04/2018 Augusto Pieracci



Multiboard Design – Up Date

I progetti di riferimento possono essere modificati in qualsiasi momento.

Le variazioni non sono riportate in automatico nella Multi Board

L'aggiornamento avviene attraverso due modalità:

Import From Child Project –

Importa gli up date da tutti i sotto progetti

Import From Selected Child –

Importa l'update del solo modulo selezionato in quel momento

Multiboard Design – Conflict

04/04/2018 Augusto Pieracci

Connection Manager

Clipboard Report Show Changes Only Show Mated Pins

Wire	From	To			
ID	Net Name	Pin	Module Net	Pin	Module Net
Wire (W_1)					
W1	+12	No Pin	No net	1-P1-1	+12
W2	RIN1	No Pin	No net	1-P1-2	GND
W3	RIN	2-P4-1	RIN	1-P1-3	No net
W4	GND/RIN	2-P4-4	GND	1-P1-4	RIN
Wire (W_2)					
W1	+12	2-P1-1	+12	2-P4-2	No net

Conflict Resolution

Swap Pins

Swap Wires

Confirm

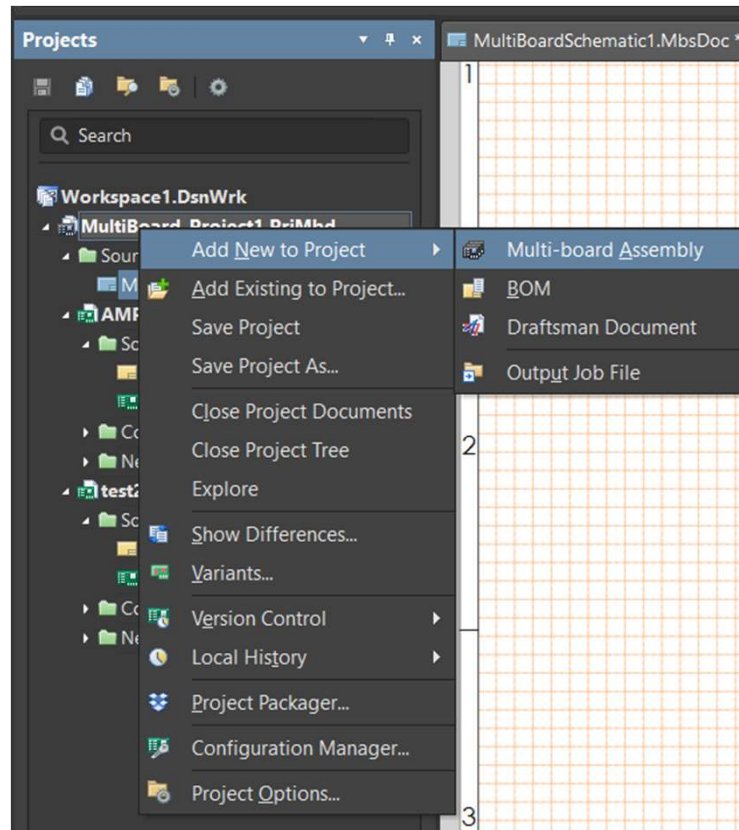
Revert

Nets connected to Pin 4 and Pin 2 were swapped

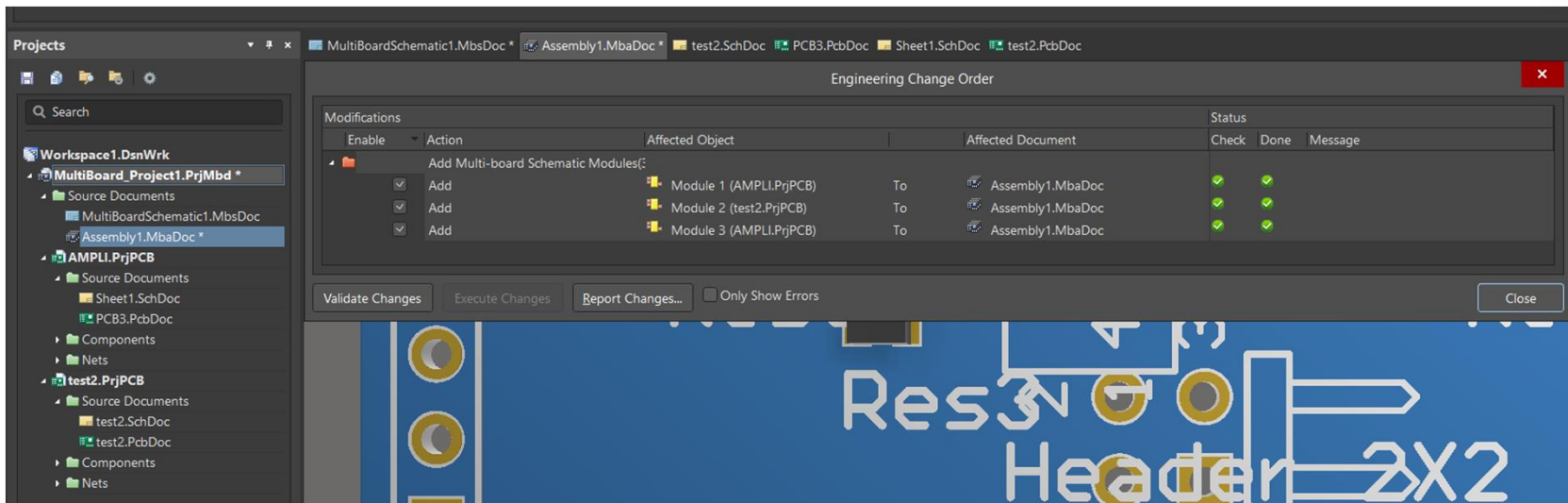
Revert Changes

Apply Changes Cancel

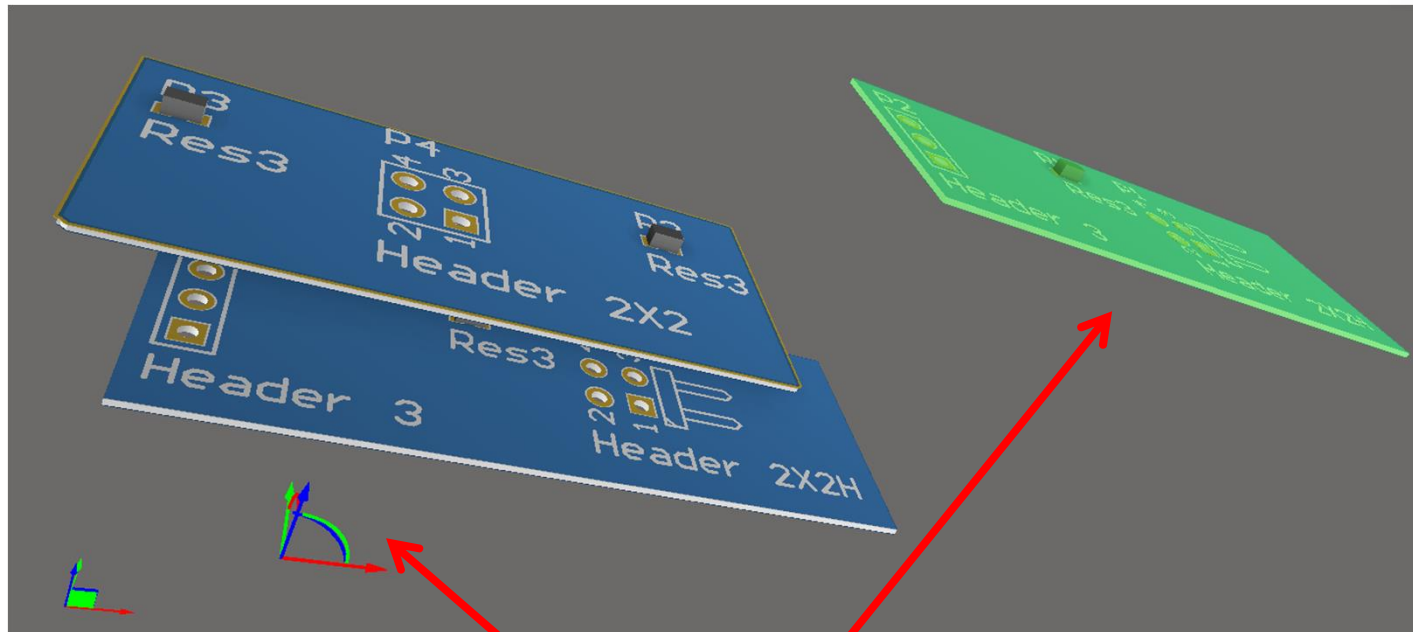
Multiboard Design – Assembly



Multiboard Design – Assembly



Multiboard Design - Assembly



Riferimento assoluto

Riferimento Board

X Rosso

Y Verde

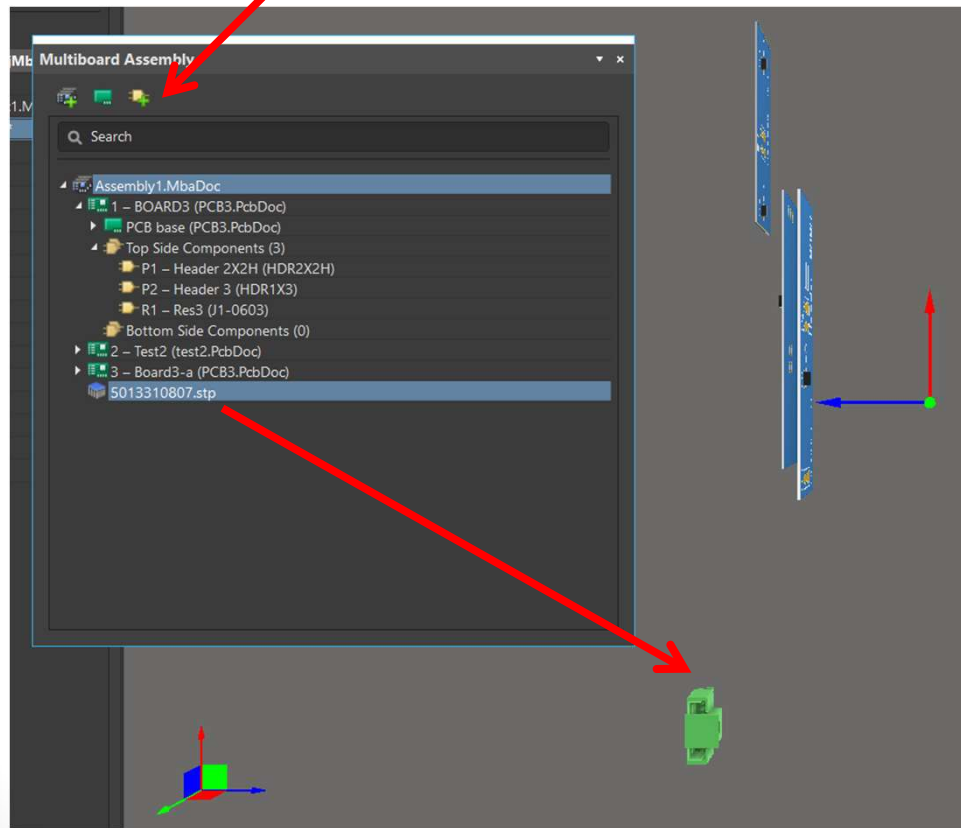
Z Blu

Short cut : Shift

Multiboard Design – Adding

Oggetto 3D

Possibilità di aggiungere altri oggetti:



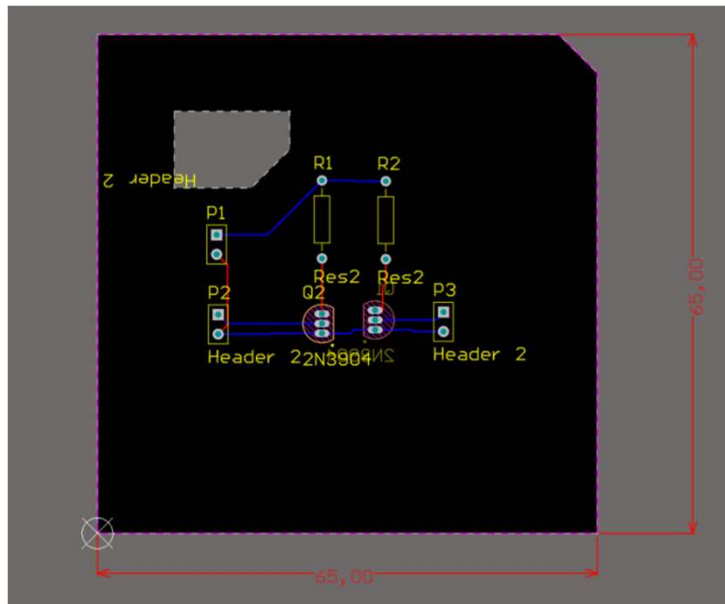
Altri MBA

Altri PCB

Oggetto 3D

Embedded Board Array

Scopo della funzione è di replicare lo stesso layout su una stessa board.
Permette di realizzare una matrice con N righe e M colonne equi distanziate.



Embedded Board Array

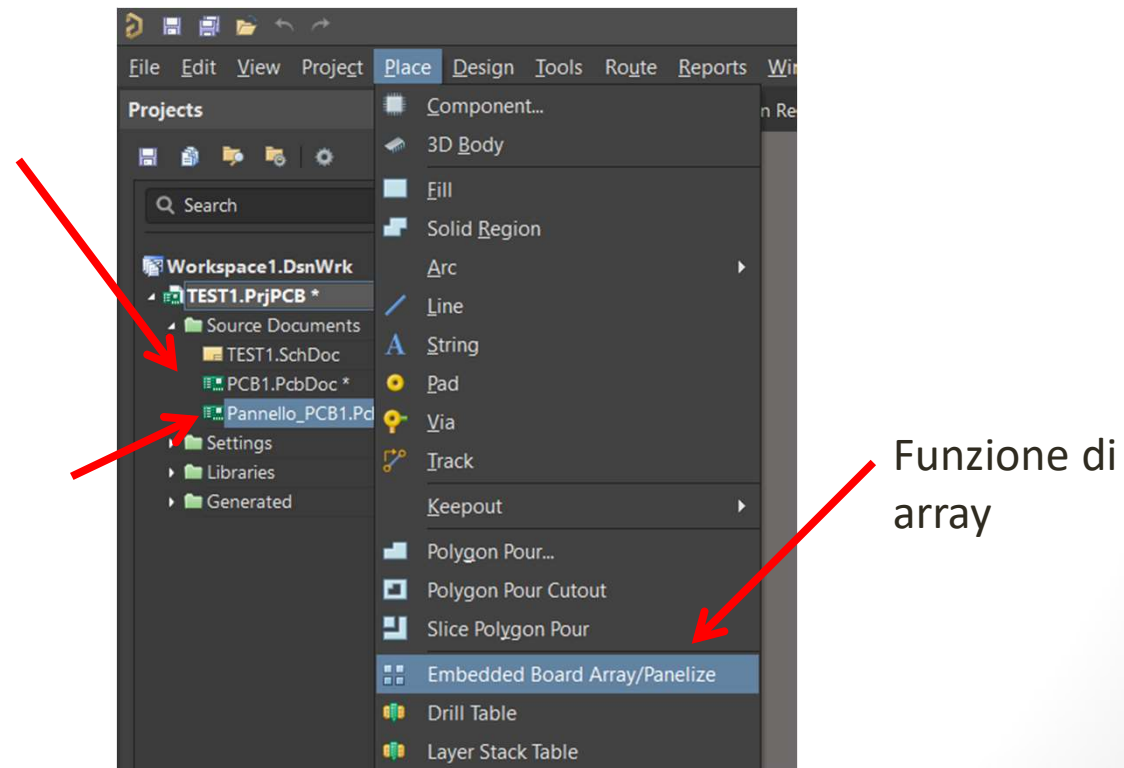
L'array deve essere realizzato su un PCB che non contiene il circuito da replicare.

Per questo motivo si crea un nuovo documento PCB.

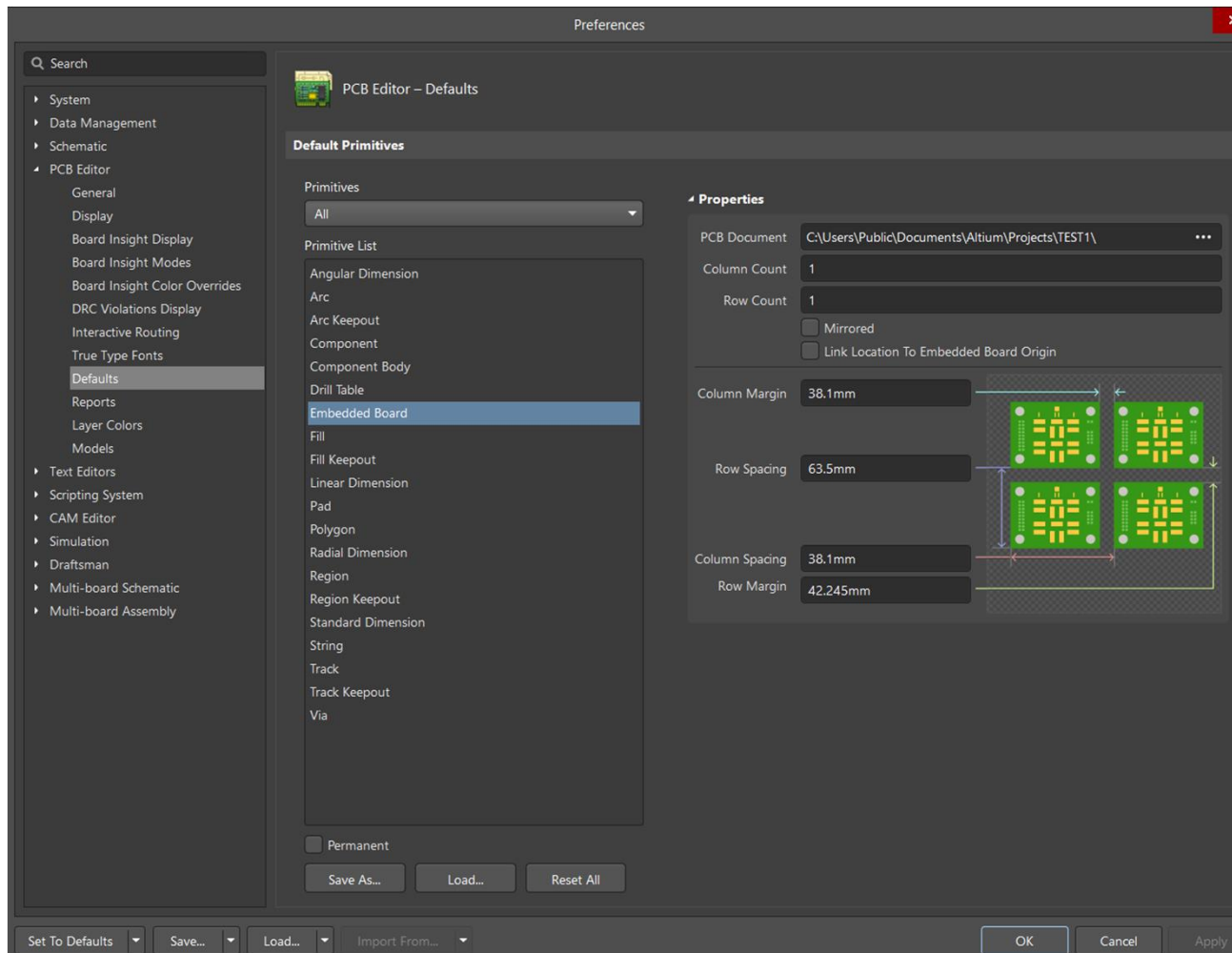
La funzione si attiva da Place- Embedded Board Array

PCB di origine

PCB array



Embedded Board Array



Embedded Board Array

Dalla finestra Properties si possono impostare i parametri e il file PCB da replicare. Si imposta lo spazio fra righe e colonne

PCB di origine

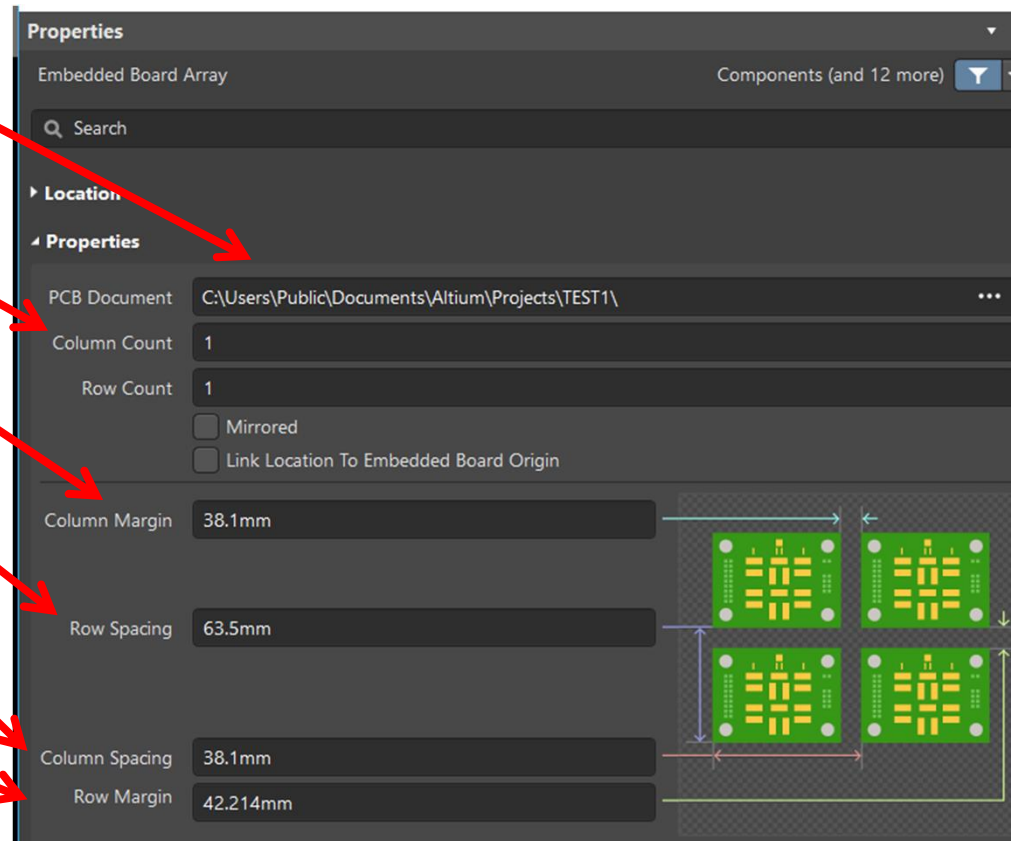
PCB array

Distanza margini
delle colonne

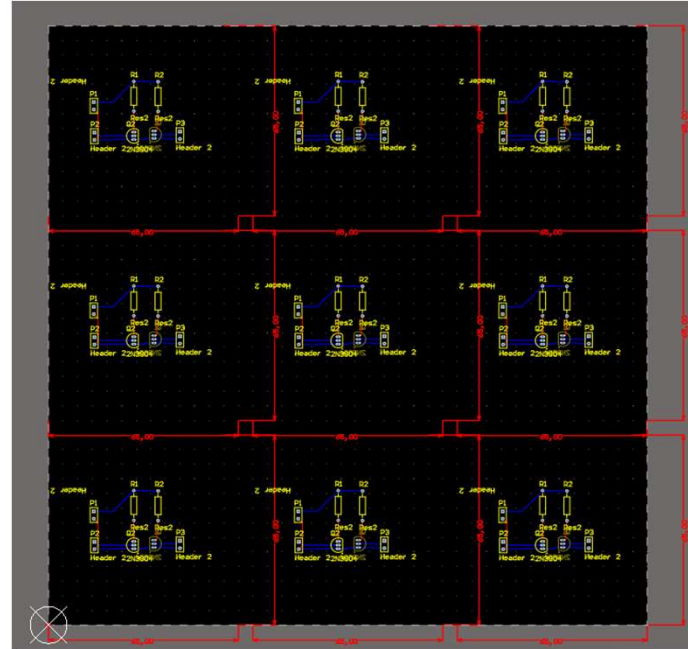
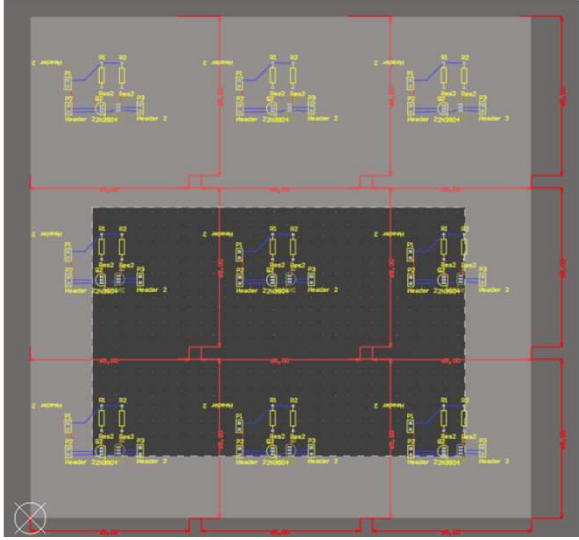
Spazio fra righe

Spazio fra colonne

Distanza margini
delle righe

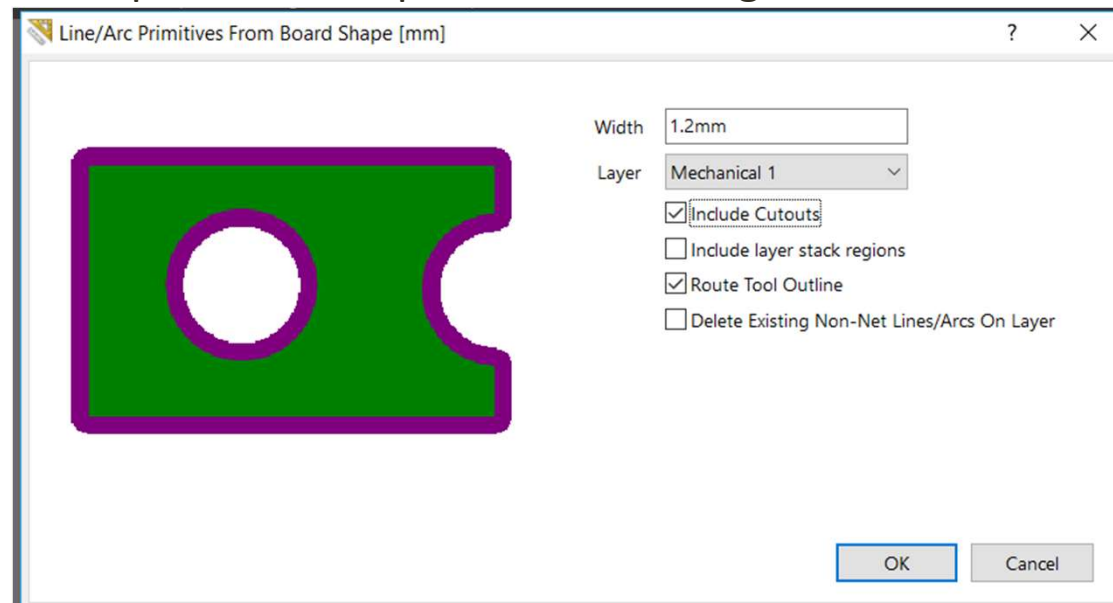


Embedded Board Array



Embedded Board Array

- Si possono inserire più circuiti.
- Le variazioni possono essere fatte nel circuito di origine e sono riportate in automatico nel pannello.
- Il DRC non è valido per il pannello !!!!
- I bordi di taglio possono essere riportati attivandoli nei circuiti di origine.
- Per inserire anche i tagli interni si attiva la modalità di incut nel Board shape
- La BOM si può fare solo per i circuiti di origine

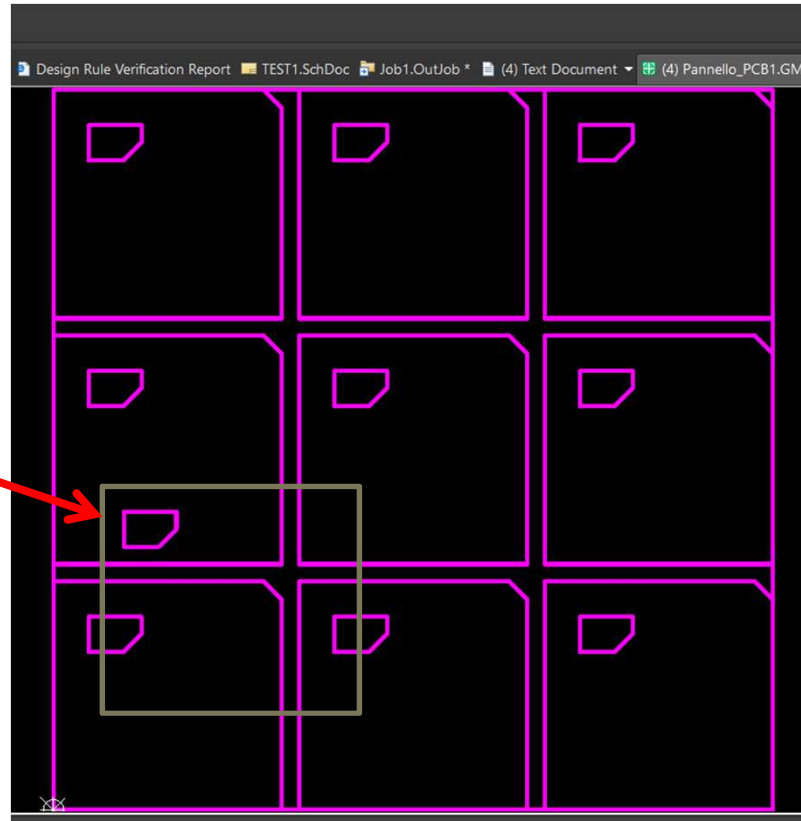


Embedded Board Array

Se voglio inserire un circuito nell'altro attenzione ai tagli dei bordi delle schede.

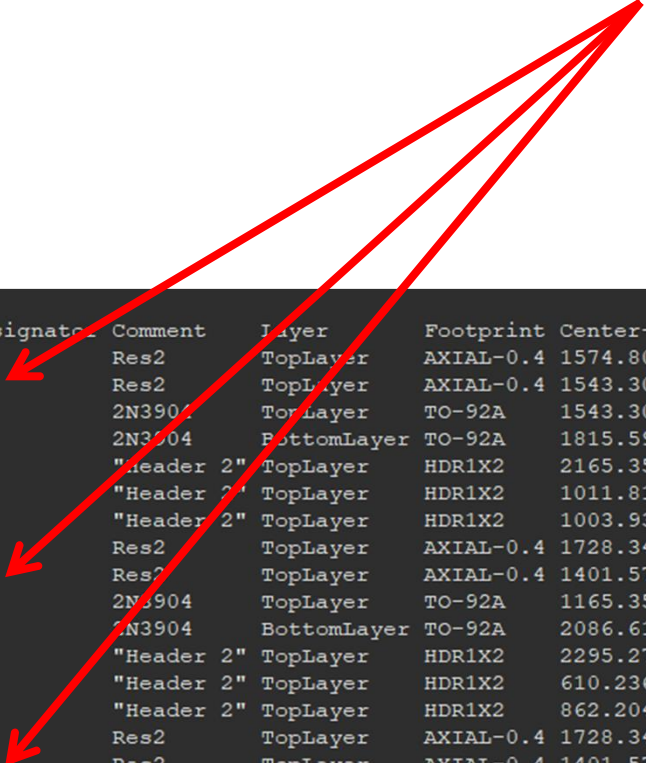
Occorre eliminare il taglio del bordo della scheda che viene inserita all'interno dell'altra

Eliminarla



Embedded Board Array

I riferimenti dei componenti sono gli stessi dei circuiti di origine.



Designator	Comment	Layer	Footprint	Center-X (mil)	Center-Y (mil)	Rotation	Description
R2	Res2	TopLayer	AXIAL-0.4	1574.803	2755.906	90	Resistor
R1	Res2	TopLayer	AXIAL-0.4	1543.306	2791.338	90	Resistor
Q2	2N3904	TopLayer	TO-92A	1543.306	2257.086	0	"NPN General Purpose Amplifier"
Q1	2N3904	BottomLayer	TO-92A	1815.591	2275.590	180	"NPN General Purpose Amplifier"
P3	"Header 2"	TopLayer	HDR1X2	2165.354	2266.536	270	"Header, 2-Pin"
P2	"Header 2"	TopLayer	HDR1X2	1011.810	2253.150	270	"Header, 2-Pin"
P1	"Header 2"	TopLayer	HDR1X2	1003.936	2662.598	270	"Header, 2-Pin"
R2	Res2	TopLayer	AXIAL-0.4	1728.346	488.189	90	Resistor
R1	Res2	TopLayer	AXIAL-0.4	1401.574	468.503	90	Resistor
Q2	2N3904	TopLayer	TO-92A	1165.354	414.567	0	"NPN General Purpose Amplifier"
Q1	2N3904	BottomLayer	TO-92A	2086.614	446.063	180	"NPN General Purpose Amplifier"
P3	"Header 2"	TopLayer	HDR1X2	2295.276	199.607	270	"Header, 2-Pin"
P2	"Header 2"	TopLayer	HDR1X2	610.236	398.819	270	"Header, 2-Pin"
P1	"Header 2"	TopLayer	HDR1X2	862.204	363.385	270	"Header, 2-Pin"
R2	Res2	TopLayer	AXIAL-0.4	1728.346	3244.095	90	Resistor
R1	Res2	TopLayer	AXIAL-0.4	1401.574	3224.409	90	Resistor
Q2	2N3904	TopLayer	TO-92A	1165.354	3170.472	0	"NPN General Purpose Amplifier"
Q1	2N3904	BottomLayer	TO-92A	2086.614	3201.868	180	"NPN General Purpose Amplifier"