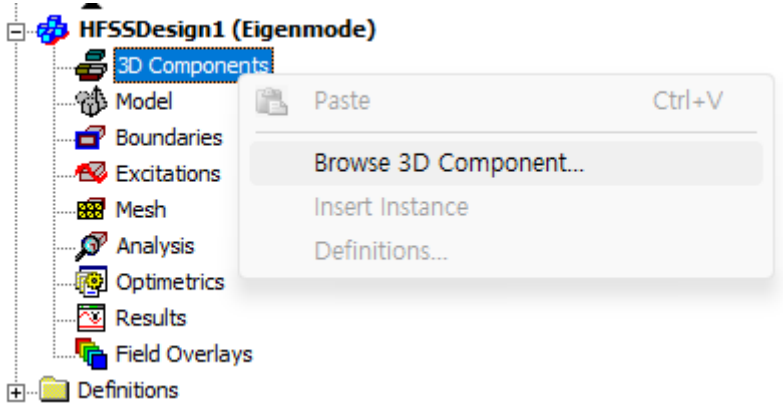
목차

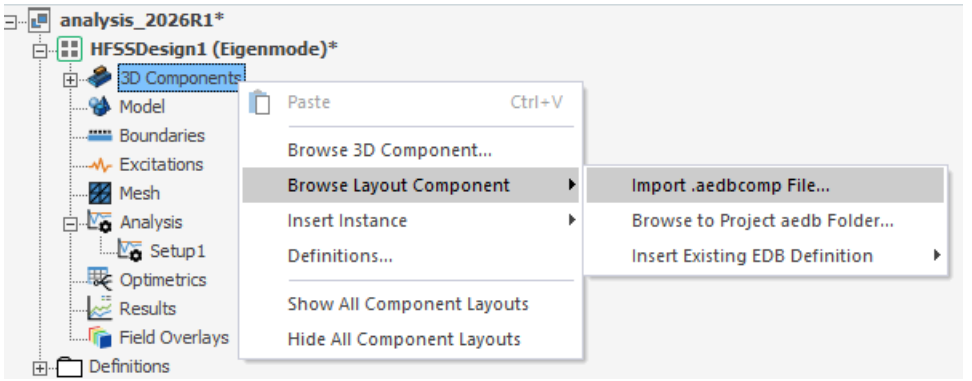
2026 R1 추가 기능

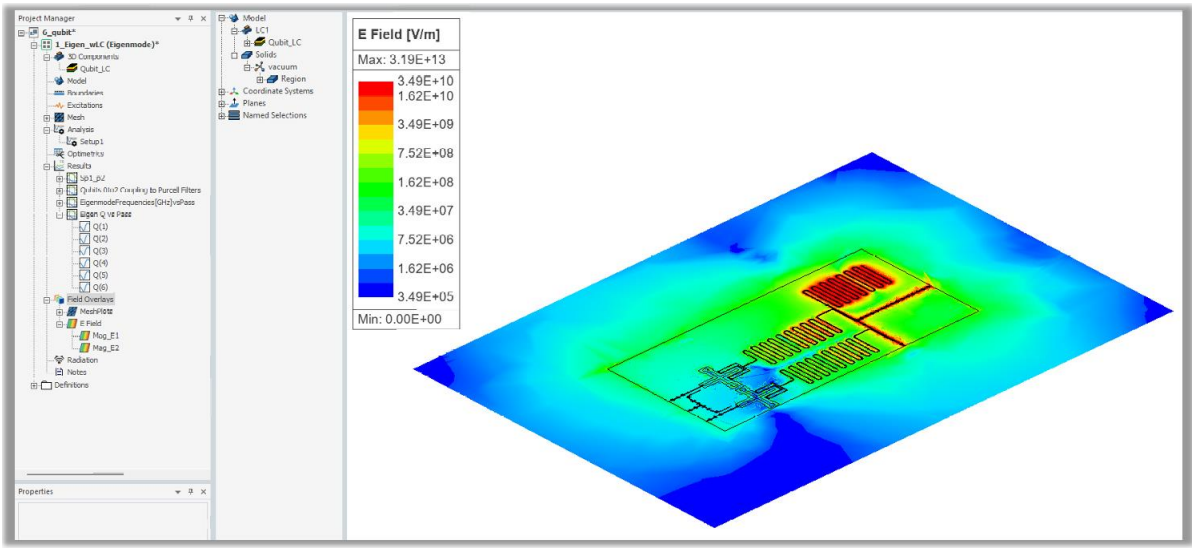
✓ Layout Component 공진 모드 해석 지원

2025R2



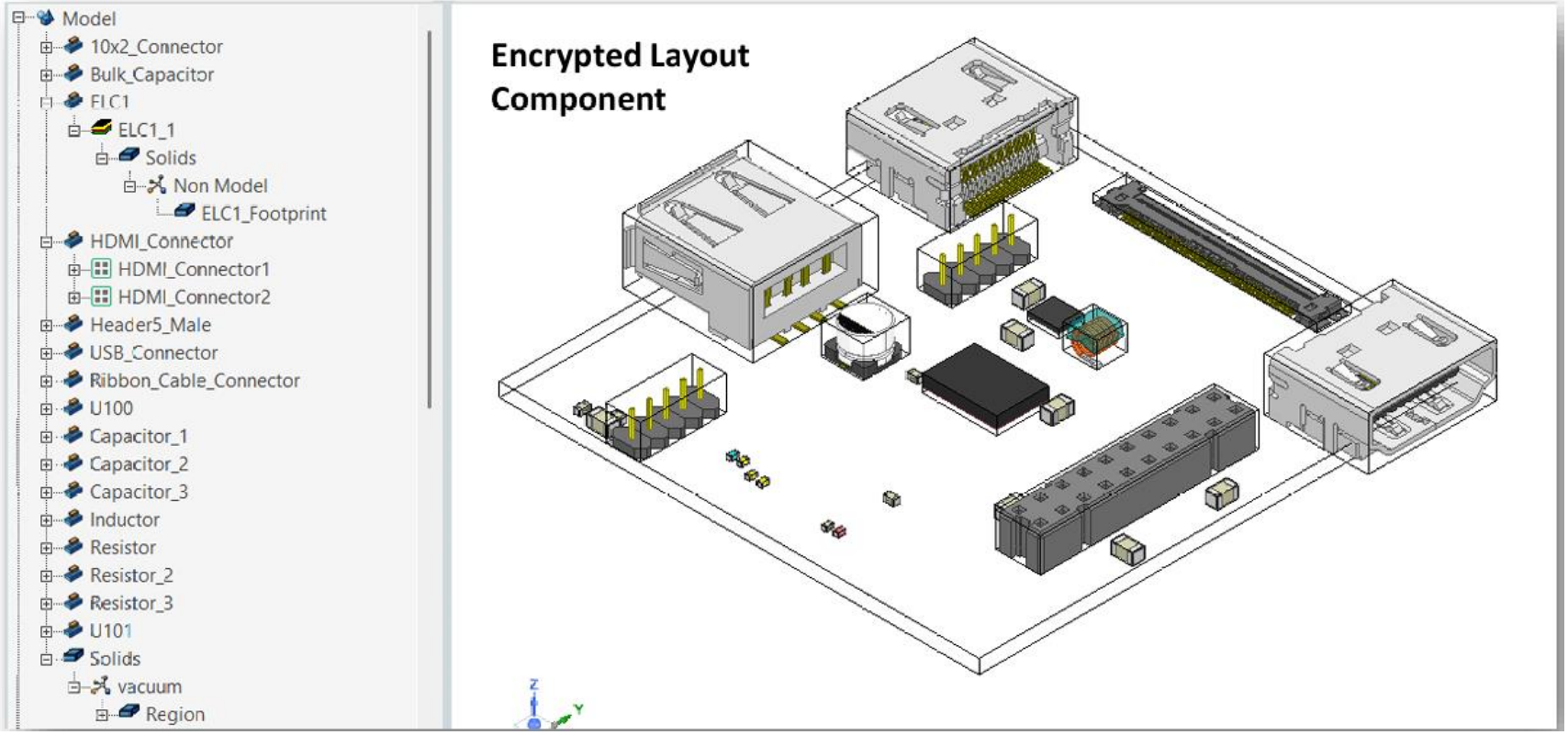
2026R1





2026 R1 추가 기능

- ✓ Encrypted layout components
  - ➢ Component의 내부 형상을 보이지 않도록 암호화
  - ➢ Materials과 stack-up도 암호화하여 공유 가능함

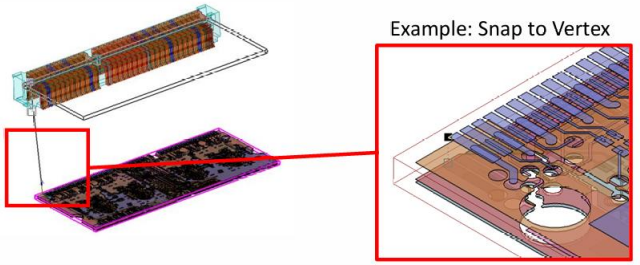


2026 R1 추가 기능

- ✓ Active layer setting to enable snapping support
  - ➢ 3D modeler UI 속도 개선
  - ➢ 선택된 Active layer에 대한 snap 기능 추가

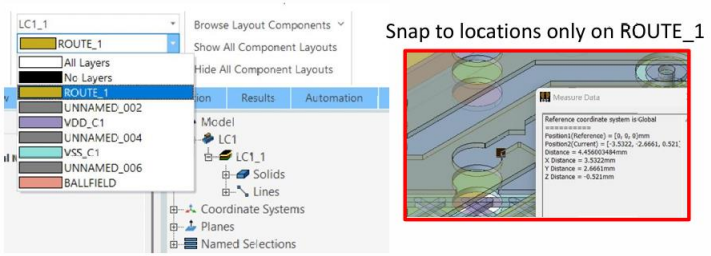
25R1: All snapping types supported in Layout Components

- Easily perform Arrange, Duplicate, Coordinate System placement, etc. operations on Layout Components in 3D

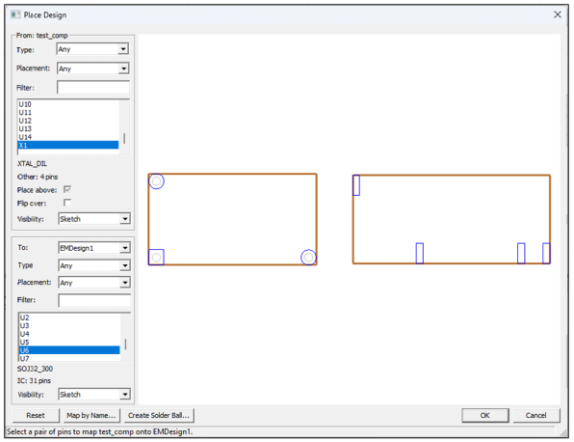


26R1: Snapping enabled only on active drawing layer

- Select active drawing layer from drop-down in Layout ribbon to enable layer-exclusive snapping support



- ✓ 참고: 3D layout design과 layout component는 place design과 pin connectivity window에서 서로 연결되는 pin을 선택하면 자동으로 component 위치 지정이 가능함

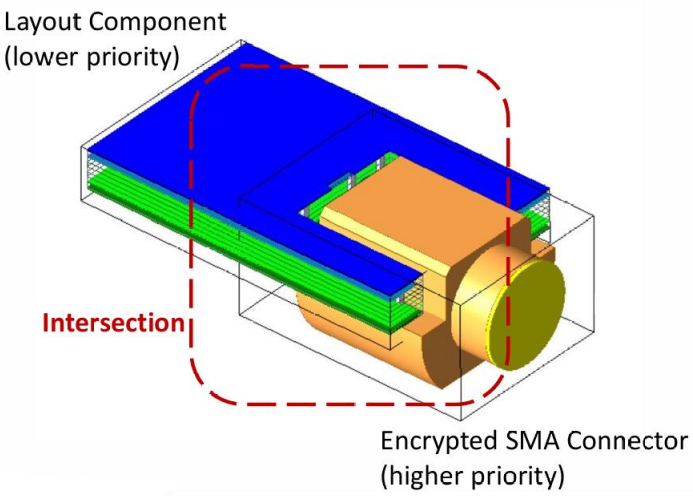


2026 R1 추가 기능

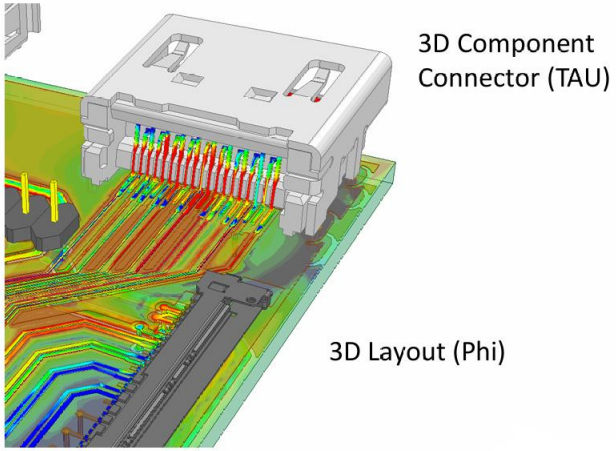
- ✓ HFSS 3D:
  - ➢ Layout component와 3D component의 물리적 간섭이 허용되고 겹치는 부분의 우선 순위 설정이 가능함

- ✓ HFSS 3D layout: TAU mesher enabled
  - ➢ Mesh fusion 기능으로 각 component의 mesher 선택 가능함

HFSS 3D: intersection is automatically resolved for encrypted components with higher priority in mesh fusion workflow



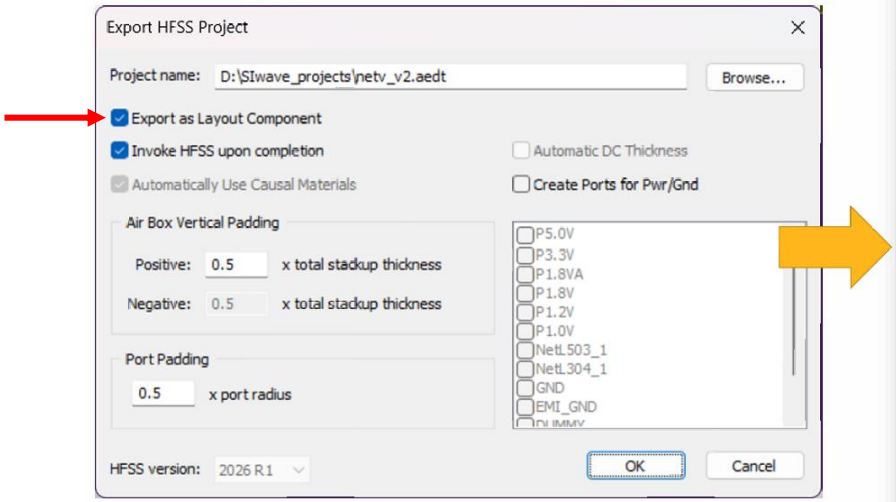
HFSS 3D Layout: TAU mesher option is now enabled for 3D Components in 3D Layout mesh fusion workflow

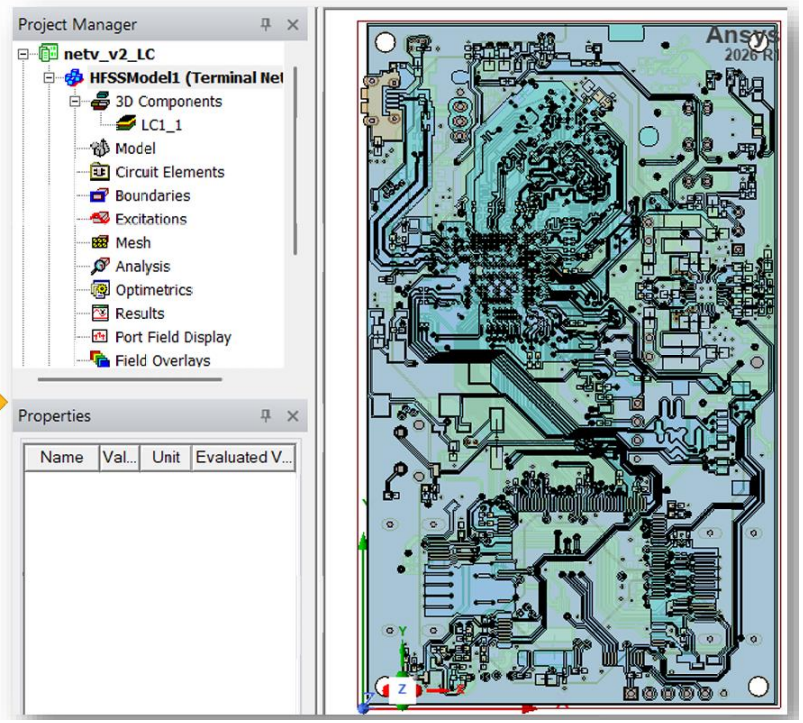


2026 R1 추가 기능

✓ SIwave에서 layout component 생성이 가능함

• Layout Component export by default



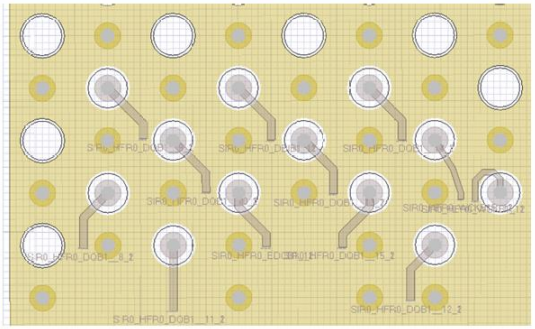


2026 R1 추가 기능

- ✓ SIwave HFSS Region
- ✓ 사용자 지정 trace 길이를 추가한 Region 생성

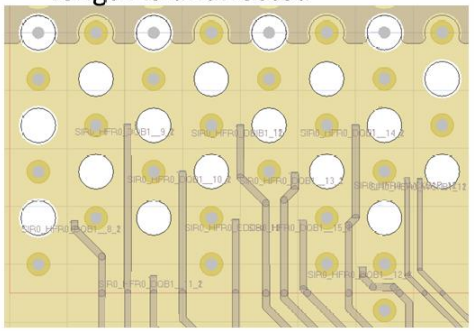
HFSS Geometry

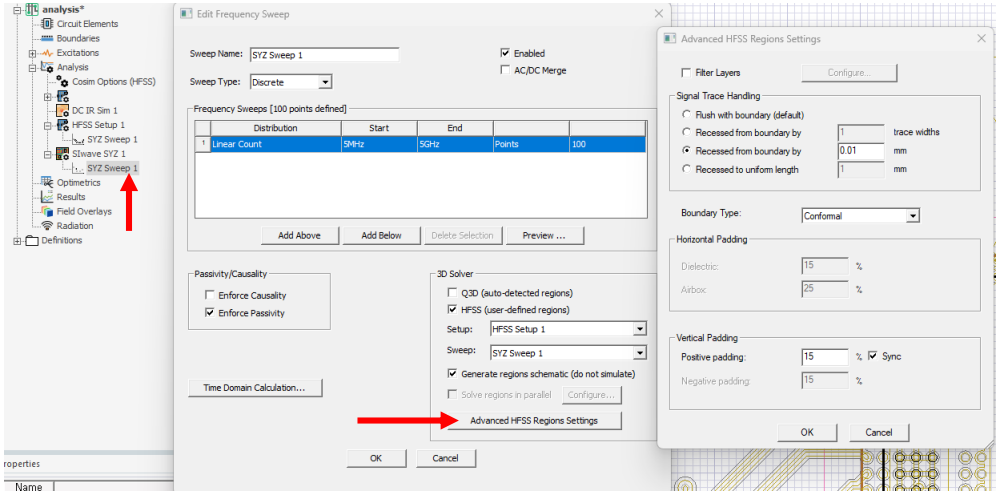
- Traces recessed from boundary to ensure each route is 1mm long



SIwave Geometry

- Traces extended into boundary to ensure each route's total length is unaffected

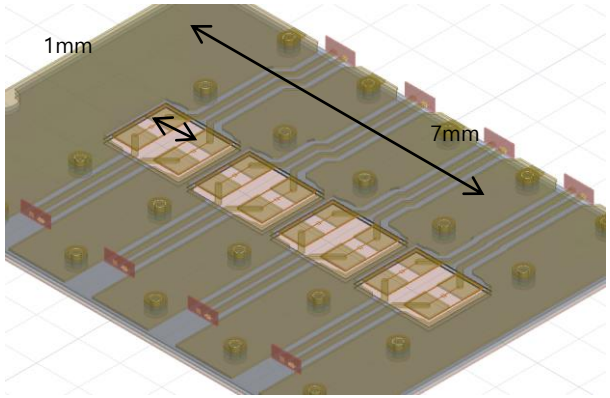


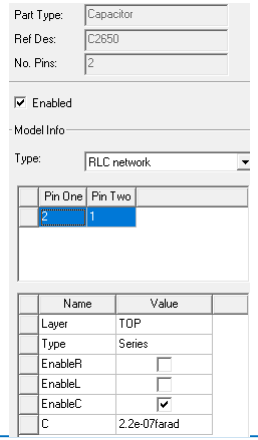


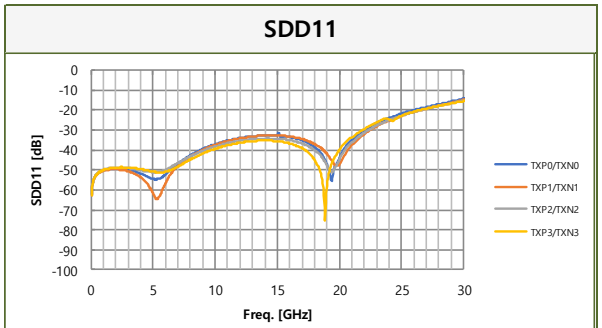
목차

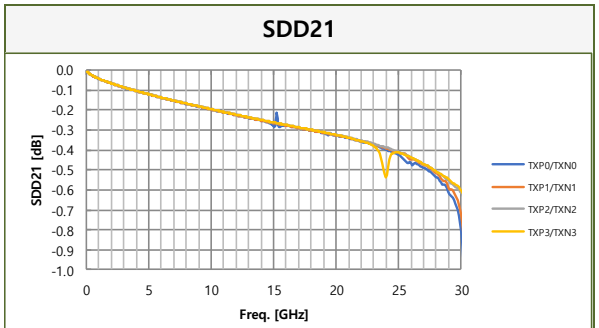
3D component 활용 사례

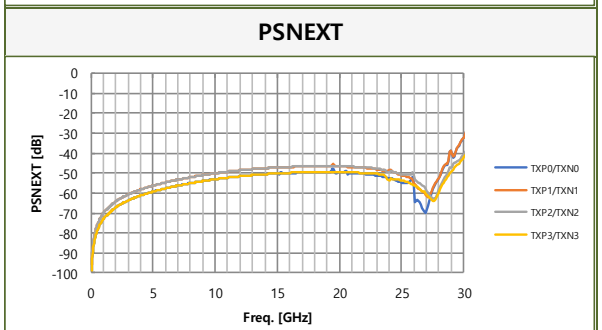
- ✓ Case1: Ideal cap, matched
  - ✓ 간격: 1mm
  - ✓ 전체 폭: 7mm

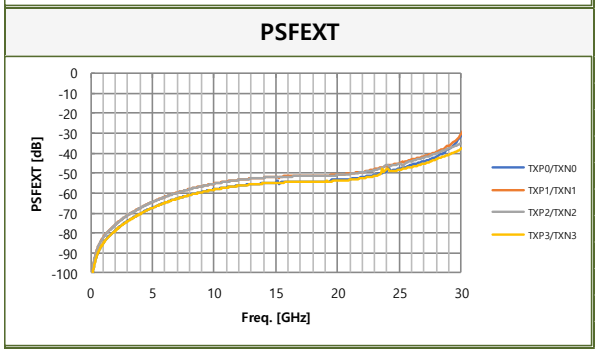


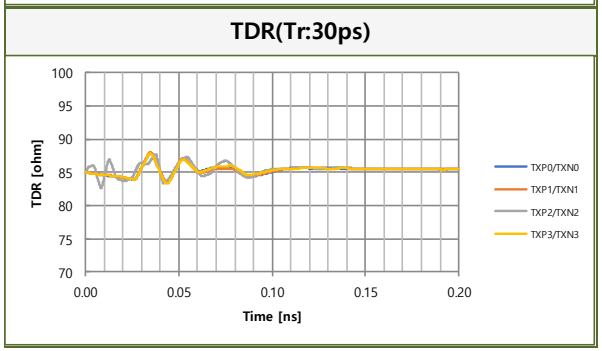


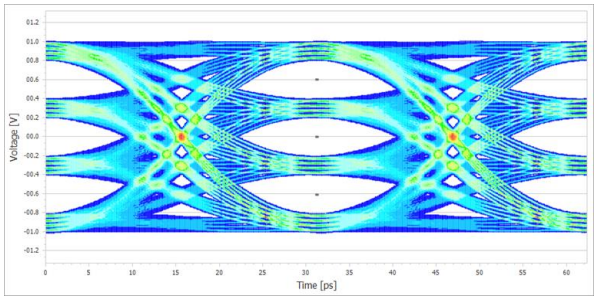










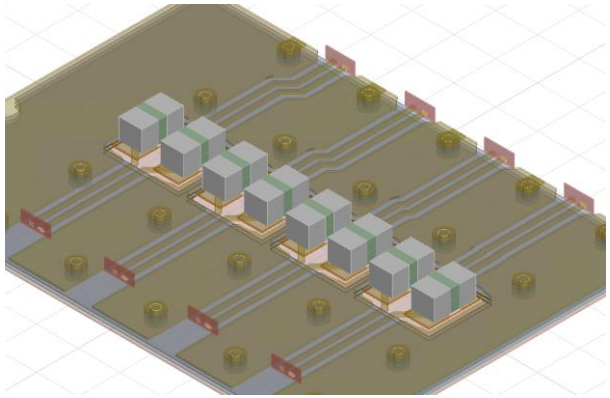


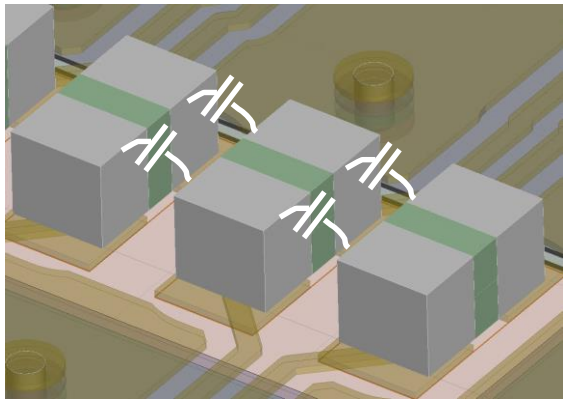
Net Name	SDD11	SDD21	PSNEXT	PSFEXT
TXP1/TXN1	-33.20	-0.28	-46.88	-51.61

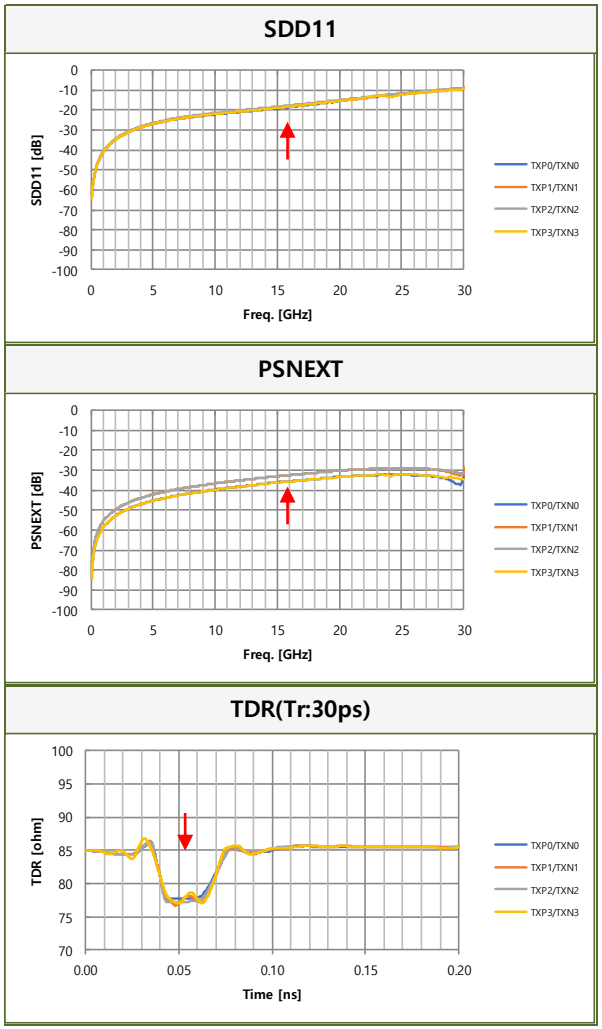
Width upper (ps)	Height upper (mv)	Width center (ps)	Height center (mv)	Width lower (ps)	Height lower (mv)
14.87	**398.99**	**18.12**	**403.42**	**14.5**	**403.42**

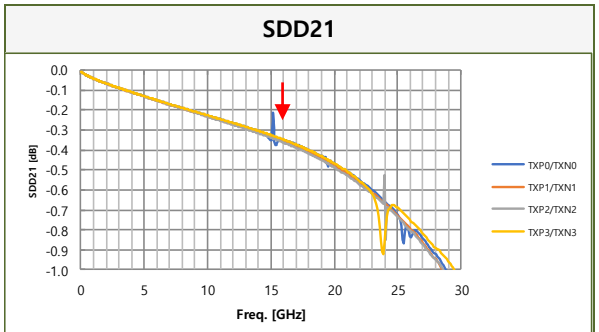
3D component 활용 사례

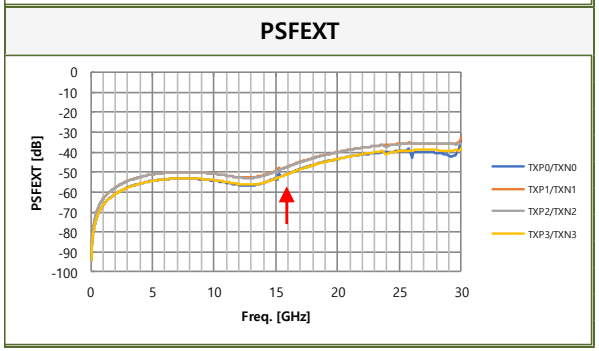
- ✓ Case2: 3D cap
  - ✓ Case1 PCB에 3D comp.로 변경
  - ✓ TDR 임피던스 ↓
  - ✓ X-talk ↑
  - ✓ Eye ↓

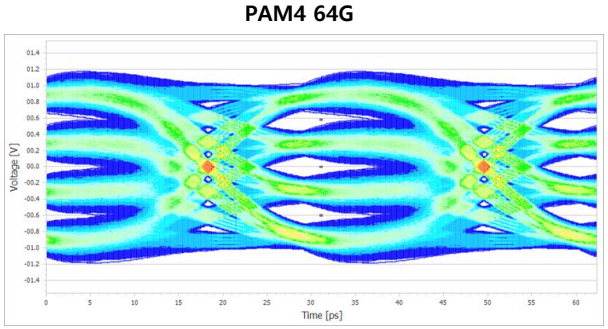










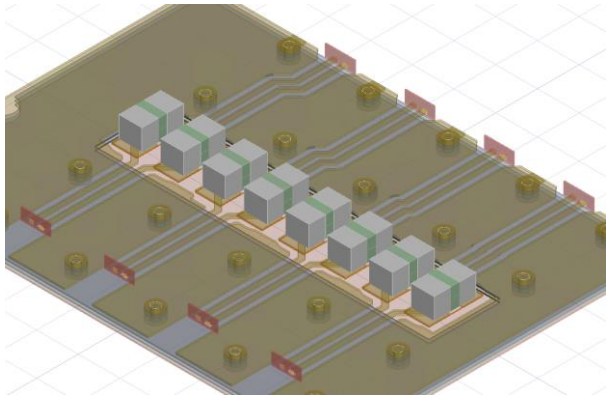


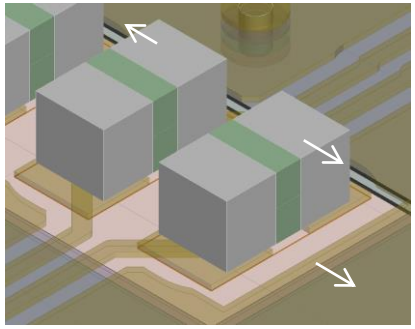
Net Name	SDD11	SDD21	PSNEXT	PSFEXT
TXP1/TXN1	-18.160	-0.355	-32.427	-47.065

Width upper (ps)	Height upper (mv)	Width center (ps)	Height center (mv)	Width lower (ps)	Height lower (mv)
8.37	145.49	12.63	176.66	10.62	161.08

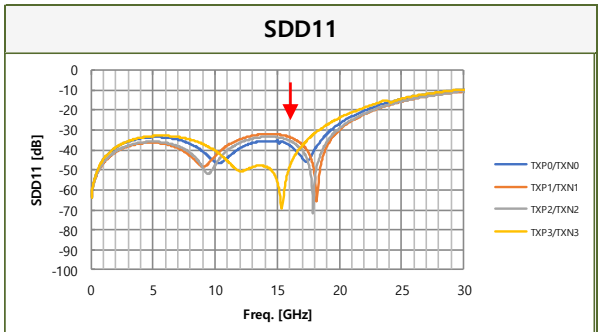
3D component 활용 사례

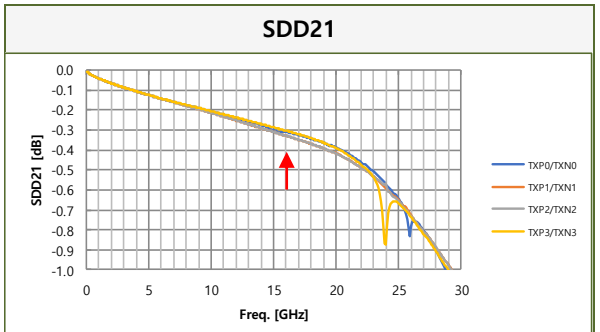
- ✓ Case3: 3D cap, matched
  - ✓ Case2 PCB를 최적화
  - ✓ TDR 임피던스 ↑
  - ✓ X-talk ↑
  - ✓ Eye ↑

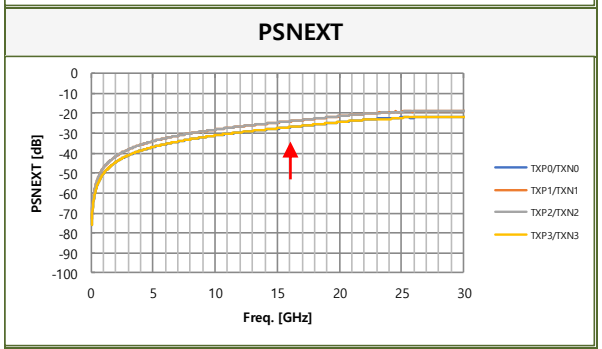


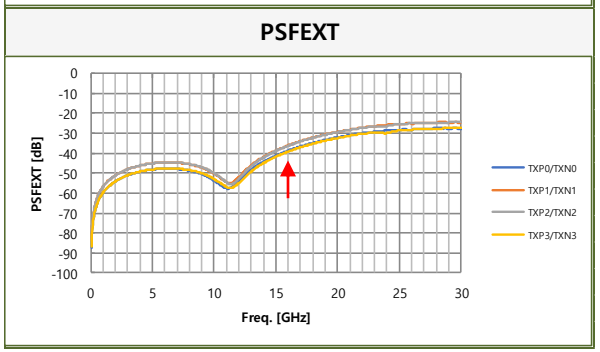


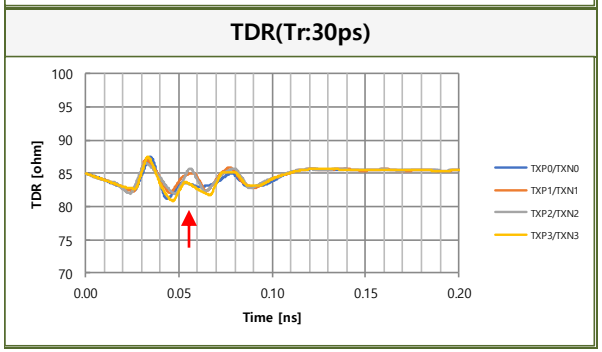
Cap 간격↑ ☞ 임피던스↑
Void 영역↑☞ 임피던스↑

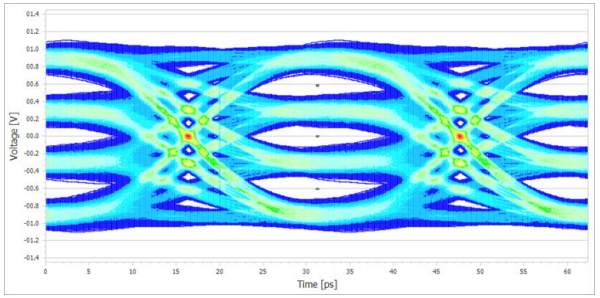










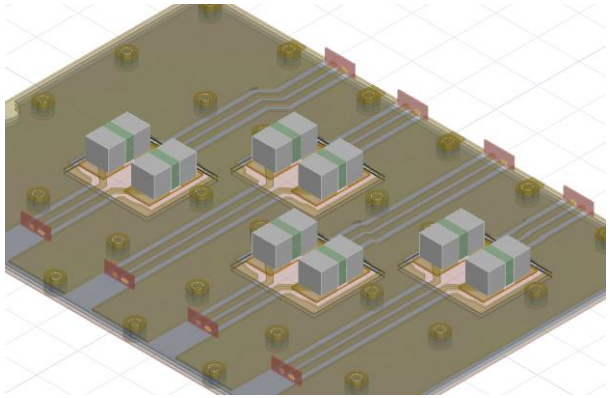


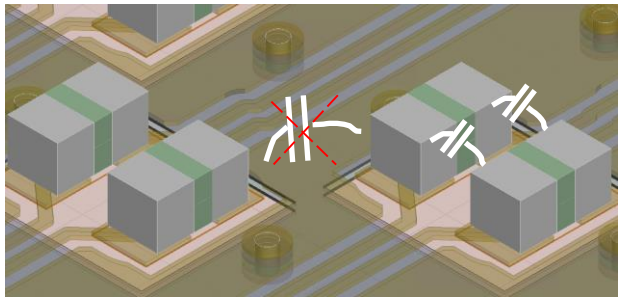
Net Name	SDD11	SDD21	PSNEXT	PSFEXT
TXP1/TXN1	-33.55	-0.33	-24.02	-36.09

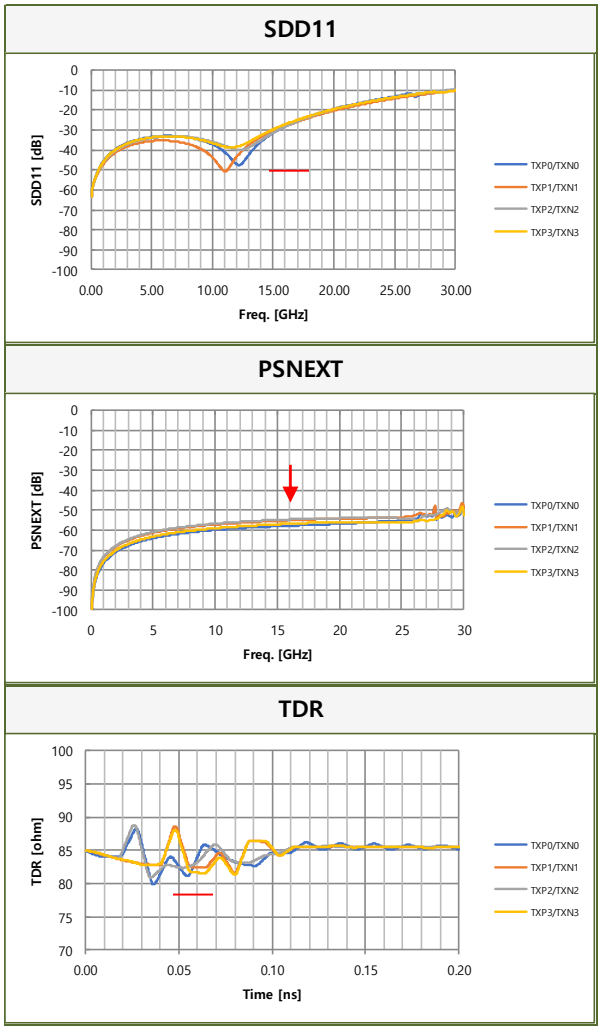
Width upper (ps)	Height upper (mv)	Width center (ps)	Height center (mv)	Width lower (ps)	Height lower (mv)
12.63	**232.25**	**15.25**	**217.74**	**12.25**	**227.41**

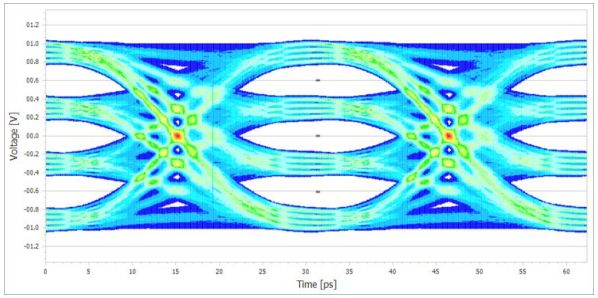
3D component 활용 사례

- ✓ Case4: 3D cap, matched, zigzag
  - ✓ Case3 cap 배치 변경
  - ✓ TDR 임피던스 ↔
  - ✓ X-talk ↓
  - ✓ Eye ↑









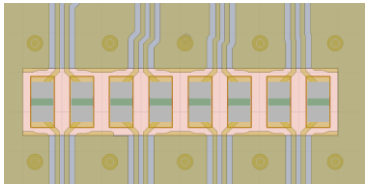
Net Name	SDD11	SDD21	PSNEXT	PSFEXT
TXP1/TXN1	-27.869	-0.280	-55.152	-54.935

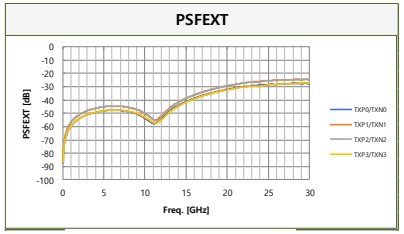
Width upper (ps)	Height upper (mv)	Width center (ps)	Height center (mv)	Width lower (ps)	Height lower (mv)
15.12	**338.03**	**18.25**	**342.59**	**15**	**347.16**

3D component 활용 사례

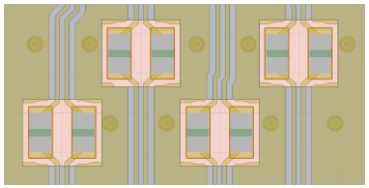
✓ 요약
- ✓ 패키지를 고려하지 않은 ideal 소자로 최적화된 PCB는 3D component를 이용한 분석 결과와 차이가 큼
- ✓ 여러 net으로 구성된 채널 분석은 cross-talk를 반영하는 time domain 분석이 필요함
- ✓ 레이아웃 밀도가 높아지고 통합이 가속화되고 있는 환경에서 3D component를 이용한 PCB와 부품의 영향 분석 및 layout component를 이용한 PCB와 패키지 등의 복잡한 커플링을 고려한 분석이 요구됨
- ✓ 채널 구성 요소를 따로 해석 후 연결하여 간편하고 빠르게 분석 가능하지만, 각 component 간의 커플링이 고려되지 않아 잘못된 평가가 될 수 있음

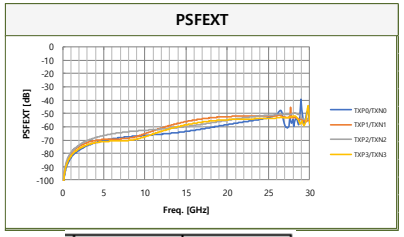
SDD11	SDD21	PSNEXT	PSFEXT	Width upper (ps)	Height upper (mv)	Width center (ps)	Height center (mv)	Width lower (ps)	Height lower (mv)
-33.20	-0.28	-46.88	-51.61	**14.87**	**398.99**	**18.12**	**403.42**	**14.5**	**403.42**
SDD11	SDD21	PSNEXT	PSFEXT	Width upper (ps)	Height upper (mv)	Width center (ps)	Height center (mv)	Width lower (ps)	Height lower (mv)
-18.160	-0.355	-32.427	-47.065	**8.37**	**145.49**	**12.63**	**176.66**	**10.62**	**161.08**
SDD11	SDD21	PSNEXT	PSFEXT	Width upper (ps)	Height upper (mv)	Width center (ps)	Height center (mv)	Width lower (ps)	Height lower (mv)
-33.55	-0.33	-24.02	-36.09	**12.63**	**232.25**	**15.25**	**217.74**	**12.25**	**227.41**
SDD11	SDD21	PSNEXT	PSFEXT	Width upper (ps)	Height upper (mv)	Width center (ps)	Height center (mv)	Width lower (ps)	Height lower (mv)
-27.869	-0.280	-55.152	-54.935	**15.12**	**338.03**	**18.25**	**342.59**	**15**	**347.16**





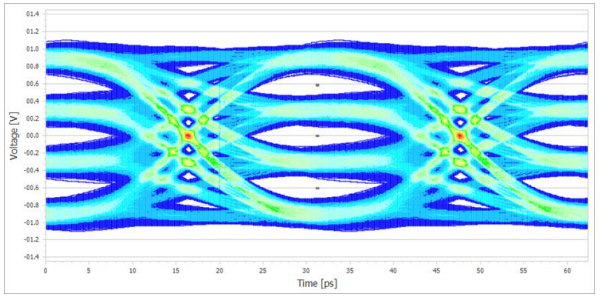
PSNEXT	PSFEXT
-24.02	-36.09



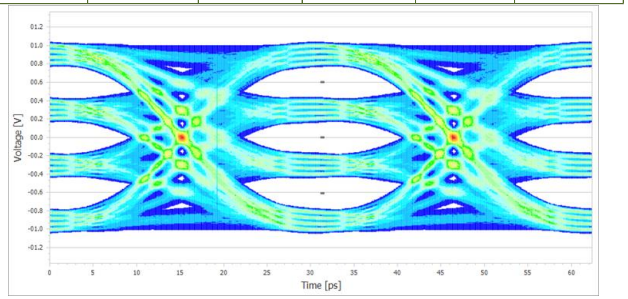


PSNEXT	PSFEXT
-55.152	-54.935

PAM4 64G X-talk on

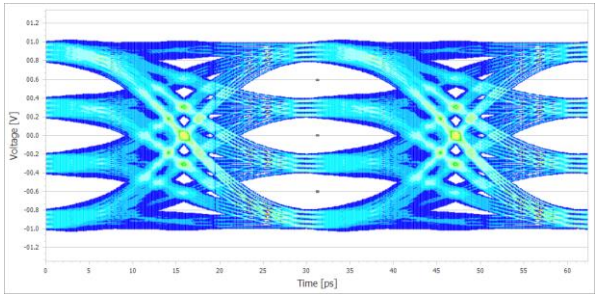


Width upper (ps)	Height upper (mv)	Width center (ps)	Height center (mv)	Width lower (ps)	Height lower (mv)
12.63	**232.25**	**15.25**	**217.74**	**12.25**	**227.41**

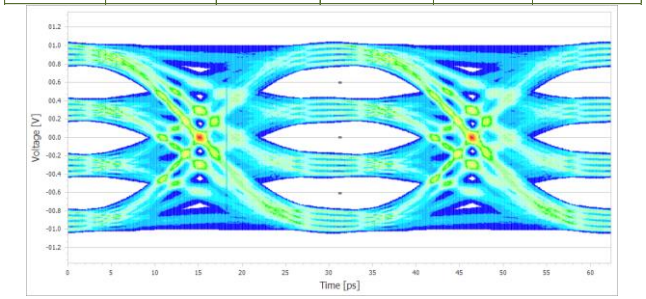


Width upper (ps)	Height upper (mv)	Width center (ps)	Height center (mv)	Width lower (ps)	Height lower (mv)
15.12	**338.03**	**18.25**	**342.59**	**15**	**347.16**

PAM4 64G X-talk off



Width upper (ps)	Height upper (mv)	Width center (ps)	Height center (mv)	Width lower (ps)	Height lower (mv)
15	**373.08**	**18.12**	**373.08**	**14.87**	**373.08**



Width upper (ps)	Height upper (mv)	Width center (ps)	Height center (mv)	Width lower (ps)	Height lower (mv)
15.25	**342.92**	**18.37**	**342.92**	**15**	**342.92**

HFSS vs HFSS 3D layout

- ✓ HFSS
  - ✓ 물리적인 형상과 재질만 존재하여 임의의 모든 형상 해석 가능함
  - ✓ 많은 자원이 필요하지만 신뢰도가 높음
  - ✓ 모든 구성요소를 자유롭게 편집 가능하지만 상대적으로 무거운 GUI가 불편함

- ✓ HFSS 3D Layout
  - ✓ 적층 구조에 최적화된 유저 인터페이스를 제공함
  - ✓ Net, stack-up, pad stack 등의 속성으로 편집이 매우 편리함
  - ✓ PCB 구조에 특화된 mesher 사용으로 속도가 빠름

- ✓ Layout & 3D component
  - ✓ 개체 내부를 직접 편집하기 어렵지만 GUI 반응속도가 빠르고 핸들링이 용이함
  - ✓ Mesh Fusion 기능으로 각 개체에 적합한 mesher 사용이 가능함
  - ✓ 암호화 기능으로 내부 구조 공개하지 않고 해석 모델 제공이 가능함