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Federal Circuit Friday

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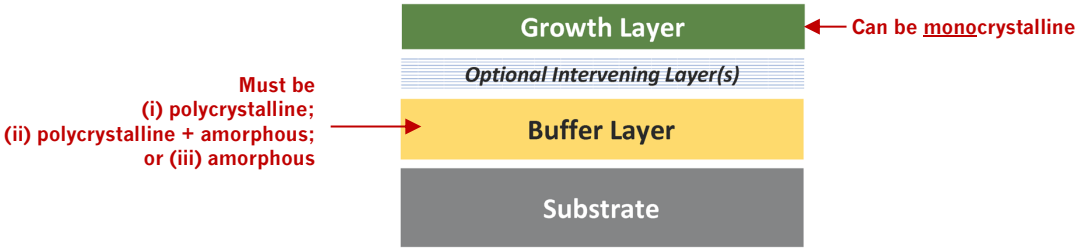
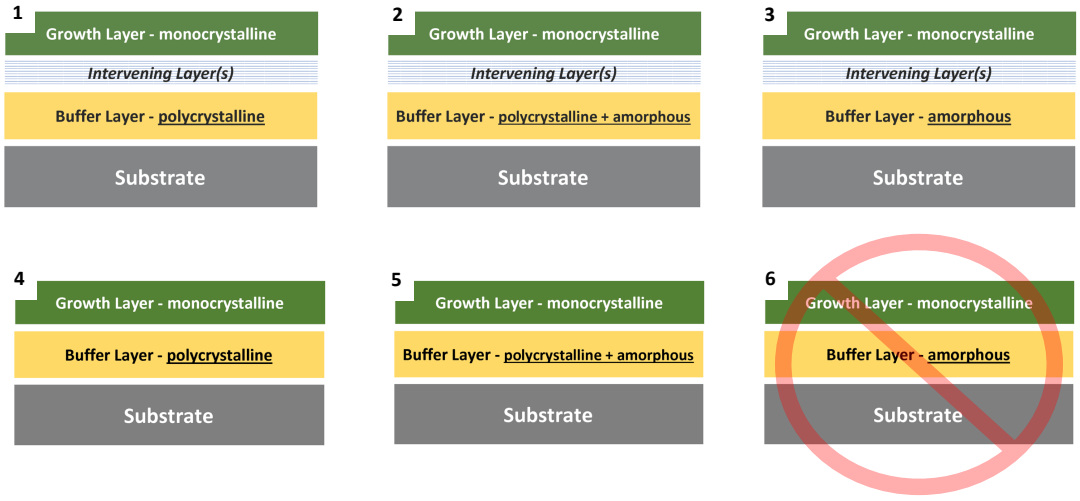
Trustees of Boston University v. Everlight Electronics et al. (July 25) provides a cautionary tale of claim scope stretching that led to invalidity *as a matter of law* for lack of enablement.

The claims relate to a semiconductor device having a defined set of structures: (i) a substrate; (ii) a *growth layer* that was *grown on* the buffer layer; and (iii) a *non-single crystalline* buffer layer situated between the substrate and the growth layer.

The district court construed the "non-single crystalline" buffer layer to be polycrystalline, amorphous, or a mixture of polycrystalline and amorphous. Boston University ("BU") asked the district court to construe "grown on" as including growth layers grown directly on the buffer layer and growth layers grown indirectly on the buffer layer (i.e., such that the "growth layer and buffer layer do not have to be in direct contact; there can be intervening layers between them"). BU also did "not dispute that 'growth layer' includes within its scope a monocrystalline growth layer." The basic structure as construed by the district court can be visualized as follows:



Here's where the problem arose for BU – where the growth layer is monocrystalline, there are six permutations within the scope of the claim, *the sixth of which was technologically impossible*:



Everyone agreed that it was not technologically possible to epitaxially grow a monocrystalline layer directly on top of an amorphous layer - "Defendants' expert testified that it is impossible to epitaxially grow a monocrystalline film directly on an amorphous structure" and "BU's expert agreed." BU made several arguments to try to save its claim from invalidity for lack of enablement:

- First, BU argued that what is and is not technologically possible regarding "epitaxial" growth was not relevant because the specification does not teach the use of "epitaxial" growth. According to BU, "because epitaxy involves [growing] a crystalline layer on top of another crystalline layer," growing "a crystalline layer on top of an amorphous structure is not 'epitaxy.'"[1] The Federal Circuit responded that "BU's contention is difficult to credit" since the 4-column specification is "saturated" with references to "epitaxy" and the argument was merely semantic. Further, the Federal Circuit asked the key question: If not by epitaxy, how *does* the specification teach growth of a monocrystalline layer directly on an amorphous layer? BU was unable to point to anything in the specification.

- Second, rather than rely on the specification, BU argued that expert testimony, inventor testimony, and post-filing experiments demonstrated that it is *possible* to grow a monocrystalline layer directly on an amorphous buffer layer. The Federal Circuit criticized the testimony as conclusory and incomplete, explained that issue was not whether it is *possible* to grow a monocrystalline layer directly on an amorphous buffer layer, and asked the key question: Did the specification teach one of skill in the art how to grow a monocrystalline layer directly on an amorphous layer without undue experimentation as of the patent's effective filing date? To this, BU did "not even suggest that [the experiments upon which it relied] were accomplished by following the specification's teachings, or that achieving [those] results was within an ordinary artisan's skill as of the patent's effective filing date."

- Third, BU argued that enabling 5 of the 6 permutations was sufficient. The Court forcefully rejected that argument: "Our precedents make clear that the specification must enable the full scope of the claimed invention" such that enabling 5 of the 6 permutations is not sufficient. "Full scope" means "full scope." Although the specification can be supplemented by "the artisan's knowledge of the prior art and routine experimentation" the specification must include a "basic enabling disclosure."[2]

The Federal Circuit noted how BU's loss was partially self-inflicted: "BU sought a construction of 'a non-single crystalline buffer layer' that included a purely amorphous layer"[3] and "[h]aving obtained a claim construction that included a purely amorphous layer within the scope of the claim, BU then needed to successfully defend against an enablement challenge as to the claim's full scope." This is a classic tension in patent litigation – stretching the claims to cover your competitor's product can open a trap door of enablement, written description, and prior art problems. Here, BU likely had no choice but to stretch the claims to capture Everlight's product (on a preponderance of the evidence standard) and took its best shot on surviving the enablement challenge (on a clear and convincing evidence standard). This was a rational risk that just didn't pay off this time.

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[1] In essence, BU argued a truism: Growth of a crystal on top of an amorphous layer is not epitaxy because epitaxy can't grow a crystal on top of an amorphous layer.

[2] *See Chiron v. Genentech,* 363 F.3d 1247 (Fed. Cir. 2004) for an intriguing discussion of the intersection of enablement, claim construction, and infringement (*e.g.*, although "the enablement requirement does not extend to technology that arises after the time of filing," per Bryson's concurrence the claims should also not be construed as covering such later-developed technology).

[3] This was where BU jumped the shark. The specification teaches an epitaxial method that involves heating an amorphous buffer layer to *crystallize* it before growing monocrystalline gallium nitride thereon. Thus, direct growth of a monocrystalline layer on an amorphous buffer layer does not appear to have been contemplated as part of the invention and this there is no reason to expect the specification to have enabled it.