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Agents and Autonomy: The Agentic transformation

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Head of Industry, Semiconductors & Physics
Microsoft Discovery & Quantum

Microsoft Discovery

 Chemistry

New compounds
and materials

 Life sciences

AI-driven
drug discovery

 Physics

Semiconductors and
multi-physics systems
development

 Others

Platform approach for
new science verticals

 Agentic enterprise platform for R&D

Cognition Layer • Graph-based reasoning • Enterprise grade, M365 integration

Agents – definitions

agent

noun

1. a person who acts on behalf of another person or group
2. a person or thing that takes an active role or produces a specified effect

GenAI agents, or Generative AI agents, are autonomous software entities that leverage large language models (LLMs) to perform tasks, solve problems, and interact with the environment, often without direct human supervision.

Agents can learn, reason, plan, make decisions and act based on internal and user specific data

Microsoft announces over 50 AI tools to build the 'agentic web' at Build 2025

Google Cloud Creates 3 Levels Of Agentic Software Coding

By [Adrian Bridgwater](#), Senior Contributor. © I track enterprise software appli...

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Published Jul 10, 2025, 02:58am EDT, Updated Jul 10, 2025, 01:27pm EDT

Agentic AI Poised to Transform Biomanufacturing

By [Gail Dutton](#) July 16, 2025

Capgemini Research: Trust and Human-AI Collaboration Key to \$450B Agentic AI Potential

Agentic AI could unlock \$450B by 2028, but trust has fallen from 43% to 27%. Human-AI teamwork and transparency will drive successful, scalable deployments.



AI Agents Market Size Worth USD 236.03 Billion by 2034 Fueled by Machine Learning and Natural Language Processing Advances

Can Perplexity's new agentic AI browser 'Comet' replace Google Chrome?

Perplexity's Comet looks to challenge Google's dominance in web browsing at a time when the tech giant could be made to sell its Chrome browser in an antitrust remedies case.

MONEYWATCH

Amazon CEO says AI agents will soon reduce company's corporate workforce

MONEYWATCH

By [Mary Cunningham](#)
Edited By [Anne Marie D. Lee](#)
Updated on: June 17, 2025 / 5:28 PM EDT / CBS News



AI Replit's CEO apologizes after its AI agent wiped a company's code base in a test run and lied about it

By [Lee Chong Ming](#)

GenAI agents will lie, threaten, and harm if they fear replacement

Article by [Lisa Haiss](#) | Jun 23, 2025

ARTIFICIAL INTELLIGENCE

Groups of AI Agents Spontaneously Create Their Own Lingo, Like People

Agents are breaking everything

Browsing & Search

Agentic browsers can plan a trip, search and buy a product, manage your social media or analyze your fantasy football choices

Agents are making decisions, so page ranking and links are no longer being explored manually

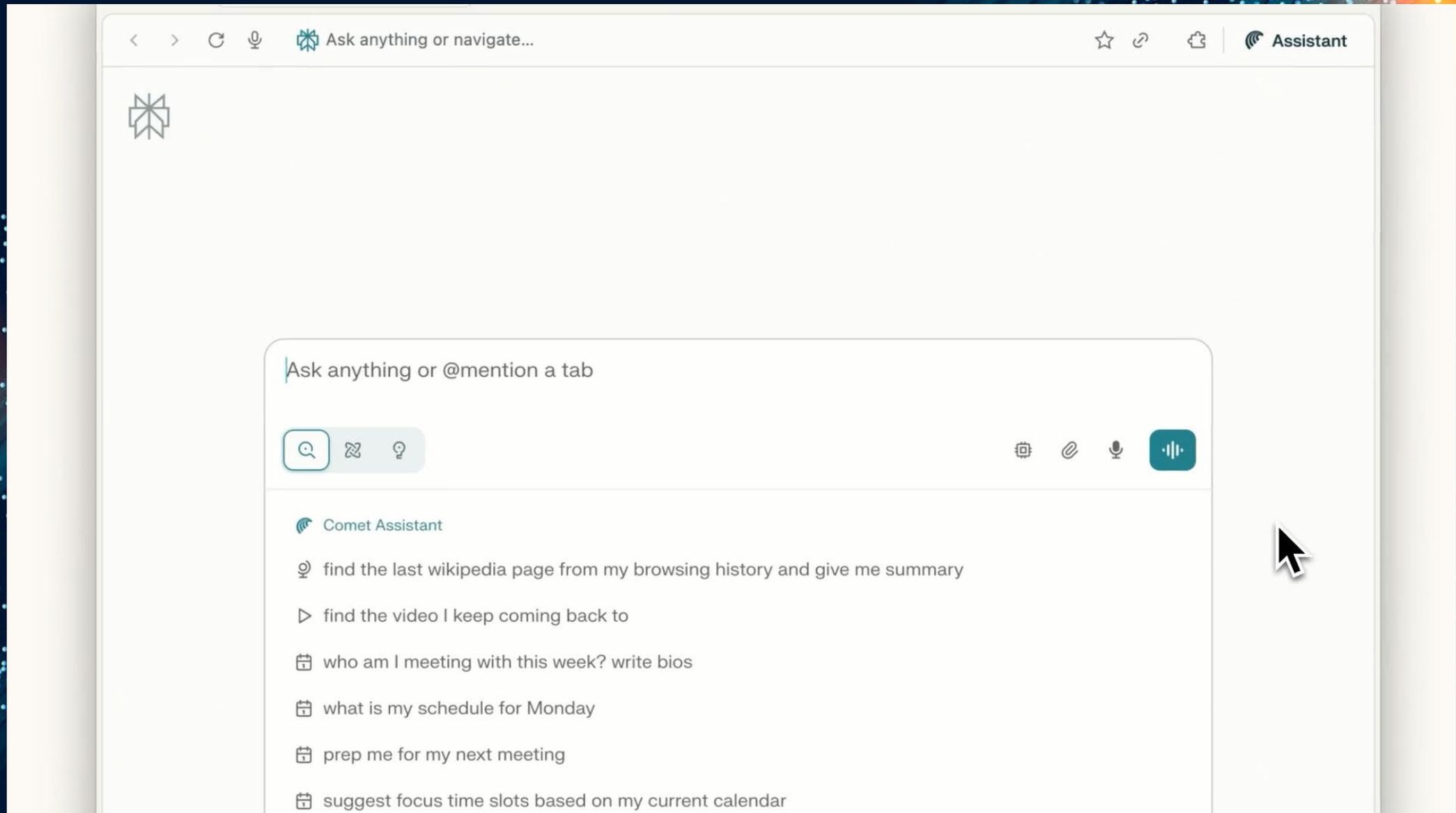
The Web

Software & Engineering

Vibe coding is redefining software development, multi-physics models are accelerating design

Anthropology, drug discovery, personalized medicine, energy, math, space exploration, next generation materials, etc.

Science



Build me an app that compares current pricing
across my competitors in the CRM space

 App type: **Auto** ▾ 



 [Start chat](#)

Microsoft Discovery (PREVIEW) FF

Workspaces > Immersion Cooling Research > PFAS - Free Coolant Discovery > Immersion Coolant v7

Copilot

The computational process to identify novel non-PFAS immersion coolants for data centers has been successfully completed based on the criteria you provided. Here is a summary of the results:

- Generated Candidate Molecules:** Using seed molecules from the report, a set of candidate molecules was generated and stored in the data asset **generated_molecules**.
- Regulatory Compliance Check:** The generated molecules were filtered to ensure they are non-PFAS and meet regulatory compliance standards. The compliant molecules are stored in the data asset **compliant_molecules**.
- Property Predictions and Filtering:**
 - Boiling point, density, and critical temperature were predicted for the compliant molecules using MolPredictor. Molecules meeting the criteria (boiling point between 25°C and 65°C, density < 2000 kg/m³, and critical temperature > 140°C) were filtered and stored in the data asset **filtered_molecules**.
- Dielectric Constant Computation:**
 - XYZ data was generated for the filtered molecules to enable dielectric constant computation. The dielectric constant was calculated using ADFT, and molecules with a dielectric constant < 6 were retained. The final filtered molecules are stored in the data asset **filtered_dielectric_constant_data**.

You can access the **filtered_dielectric_constant_data** asset to review the final list of molecules that meet all the specified criteria. This asset includes detailed information such as SMILES strings, optimized geometries, single-point energy values, and dielectric constants.

Let me know if you need further analysis, additional computations, or assistance with anything else!

boiling_points.json
compliant_molecules.json
critical_temperatures.json
density_values.json
dielectric_constant_data.json
filtered_dielectric_constant_data.json
filtered_molecules.json
generated_molecules.json
molecule_xyz_data.json
optimized_geometry_data.json
seed_molecules.json
single_point_energy_data.json

Copy

Message Copilot

0 / 2000

AI-generated content may be incorrect

Amine

Alkene (Olefin)

Alkane (Alkyl)

Info Rendering

SMILES Input

Example: CC(=O)O for acetic acid

2D Structure

Molecular Properties

Density: 653.5382

Input_BoilingPoint: 58.06448

Input_CriticalTemperature: 244.0495

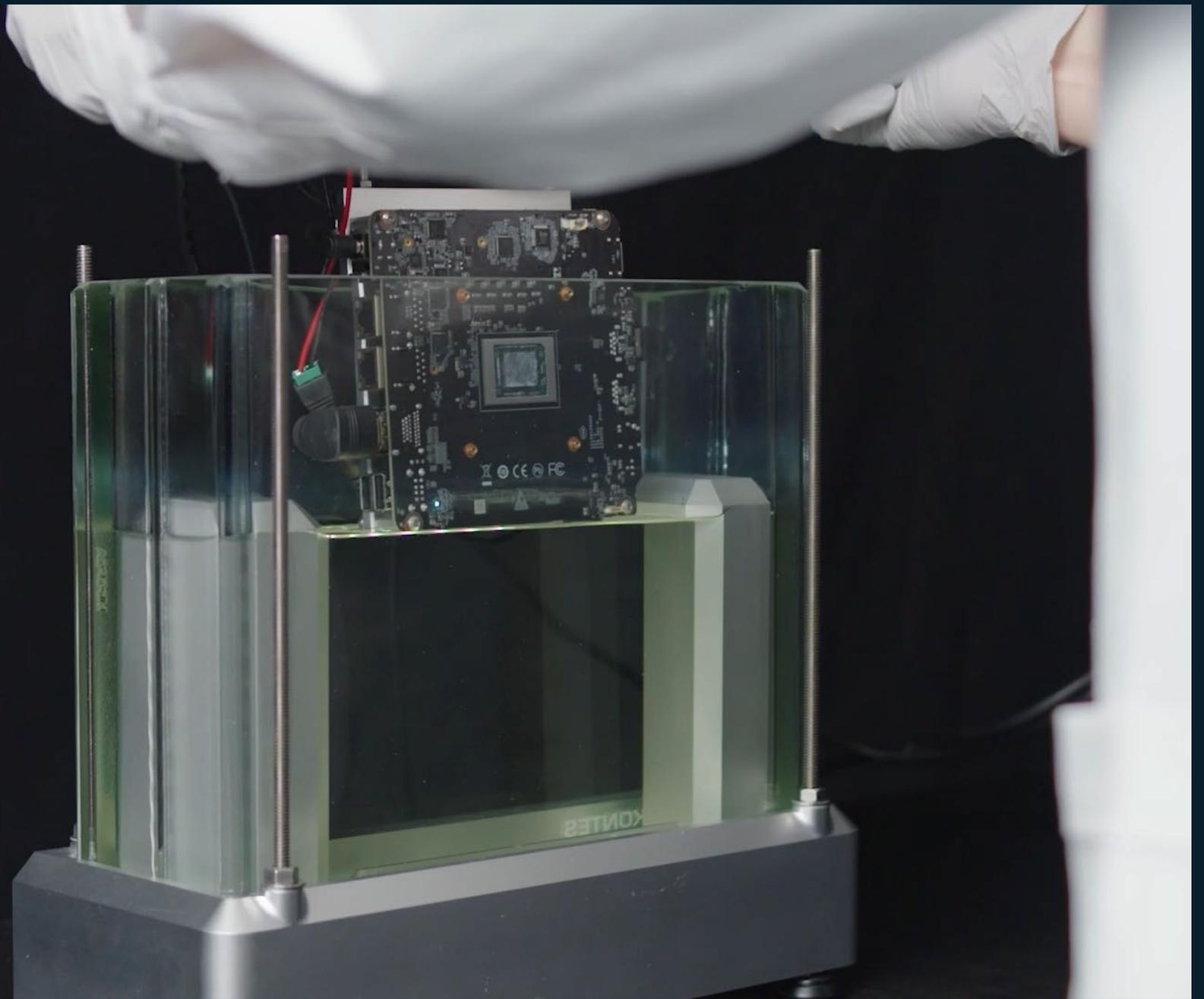
dielectric_constant: 3.706658879

dipole: 0.017258949

polarizability: 25.277

Functional Groups:

- Alkane (Alkyl) (4x)



Pharmaceutical challenge problem:

Develop an approach for the next generation monkeypox vaccine.

 View prompts

Develop an approach for a next generation monkeypox vaccine. Identify current limitations of mpox vaccines, methods to improve their duration and effectiveness



Key Viral Genes and Their Functions

A29L and M1R Proteins

The A29L and M1R proteins are notable for their role in the immune response against mpox. Both A29L and M1R are highly conserved surface proteins critical for the virus's attachment and entry into host cells (Entities 7732, 24120). These proteins are essential for inducing high neutralizing antibody titers, thereby enhancing the immunogenicity of potential vaccines (Relationships 735, 21765). Their conservation across different viral strains underscores their significance as targets for vaccine development (Entities 7732, 7733, 15850, 226).

E8L Protein

The E8L protein is recognized for its immunogenic properties and is included in multi-epitope vaccines targeting mpox. Its intrinsic role in viral attachment and penetration makes it indispensable in immune response modulation (Entities 15850, 19882, 37800).

Modifying the E8L protein can enhance vaccine formulation by improving its ability to stimulate a robust immune response (Entities 15850, 37800; Relationships 735, 14353).

Conserved Viral Epitopes

The identification of conserved viral epitopes is crucial for developing broad-spectrum vaccines that provide immunity across different viral strains. Conserved epitopes such as those found in the MPXV-VeroE6 strain allow for the design of vaccines that elicit immune responses targeting these stable regions, improving vaccine efficacy (Sources 4635).



Task Manager



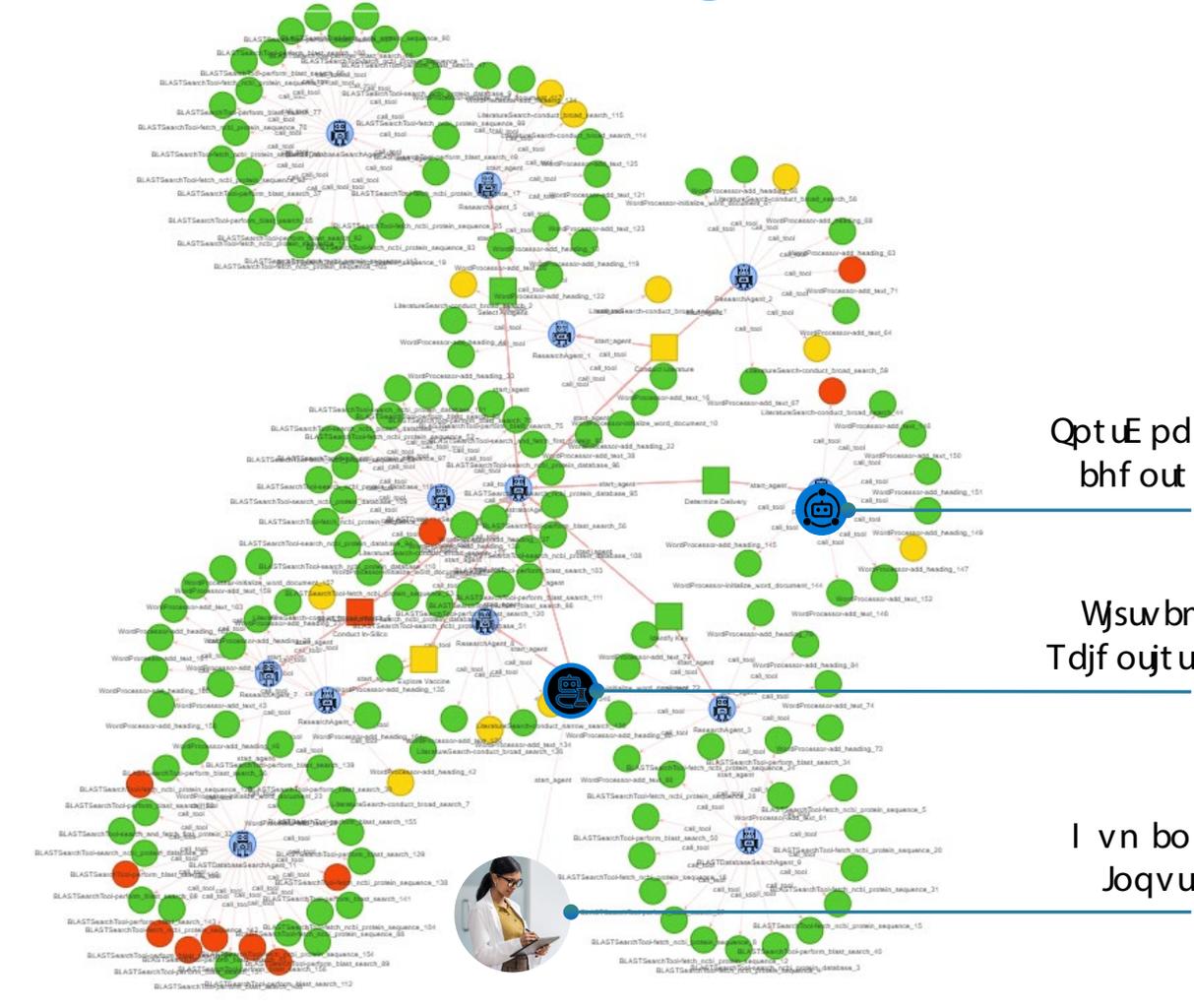
Computational
Biologist



Drug
Specialist

Task Execution

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I vn bo
Joqv u



Tdjf ojt u



Wjsu brt djf ojt u
Scientific method



Of ux psl !pgQpt uE pd!bhf out

Jo!Tjw !Hsbejoh!pgUbt ! !Fyf dv ujo



21!B hf out



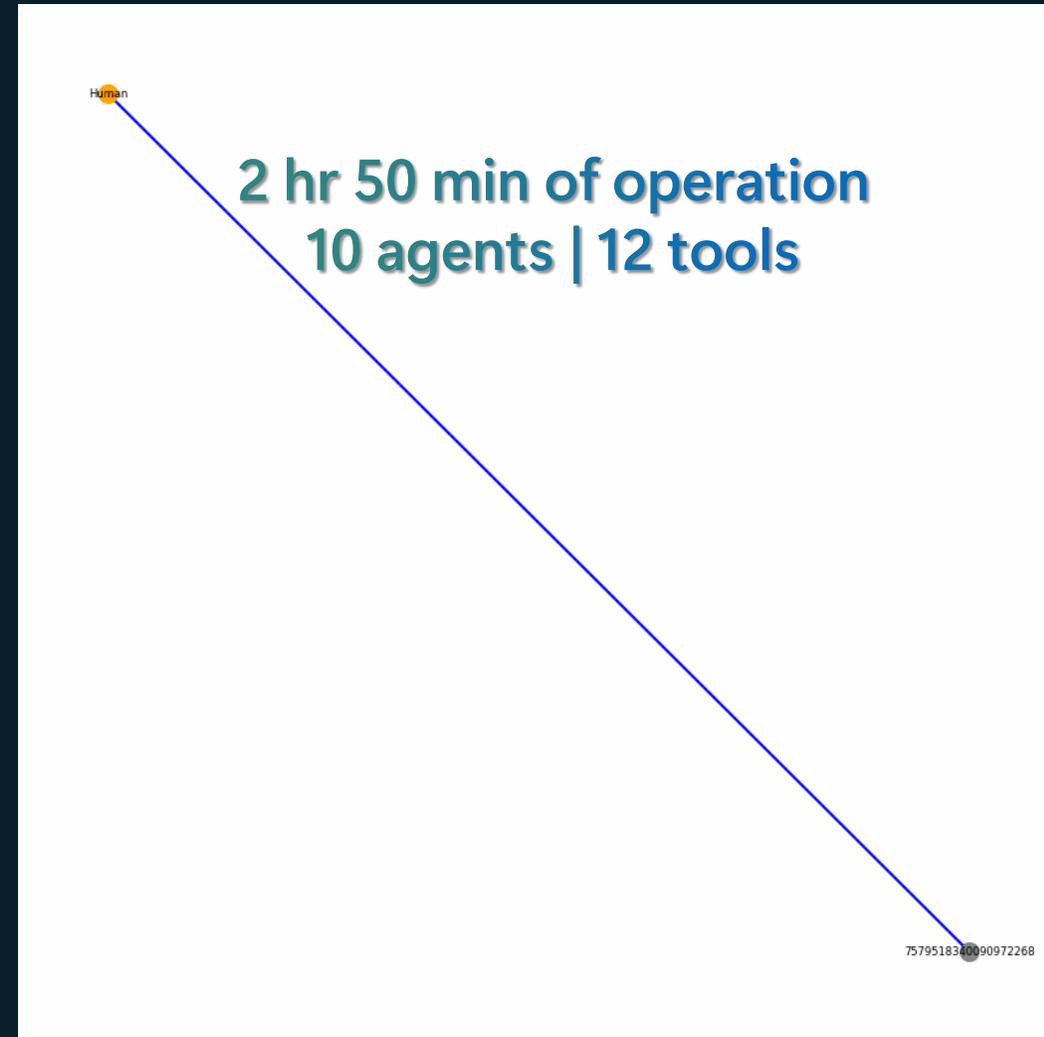
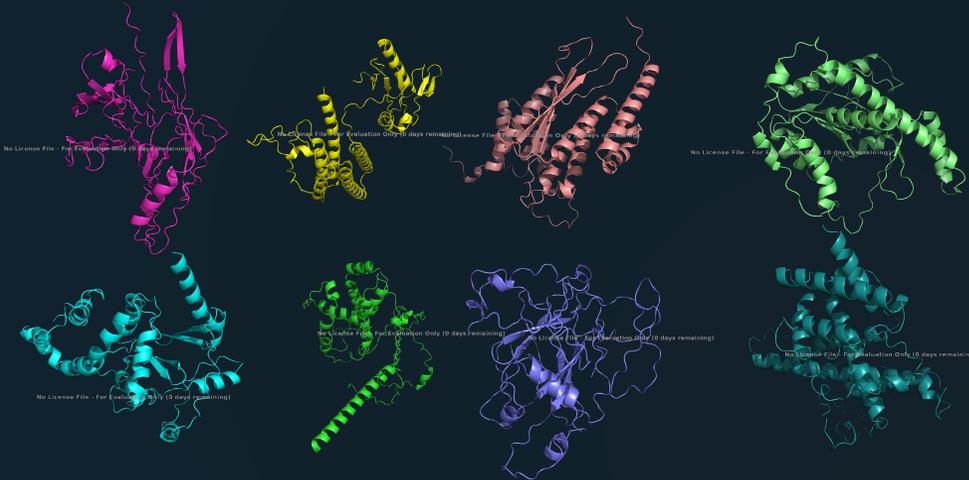
23!Upprh

- | | |
|-----------------------------------------|------------------------|
| DatasetCurationAgent | ScienceFoundationModel |
| InSilicoProteinDesignAndGenerationAgent | EvoDiff |
| ResearchAgent | BLAST |
| SafetyAnalysisAgent | ImmuneEpitopeDB |
| WriterAgent | UniProt |
| OrchestrationAgent | MAFFT |
| BLASTSequenceHomologyAgent | Muscle |
| ImmuneEpitopeDBAgent | Clustal |
| ScienceFoundationModelAgent | GraphRAG (Library) |
| UniProtKnowledgeBaseAgent | Word Processor |

Full Overview of the Run

Write a comprehensive report that identifies the current limitations of monkeypox vaccines, methods to improve their duration and effectiveness, and key genes and proteins that drive immune response and pathogenicity. I'd like to dive deep into the tradeoffs of vaccine delivery mechanisms: live attenuated, inactivated, subunit, and nucleic acid vaccines, etc... With that background, suggest a new vaccine design that could overcome these limitations. This vaccine design should examine the specific antigens, adjuvants, and delivery mechanisms that would be used, as well as the protein structure and mechanism of action. Your design should select and provide the rationale for the selection, comparing the proposed vaccine design to existing vaccines for why it would be more effective. Once you have your design, collect the necessary data for in-silico experiments, perform them, and assess the safety of the generated results. I would like to know which experiments you performed, the results, the tradeoffs on your different designs, and the final recommendation for the vaccine design. Please provide a detailed report with all the data and results for my review.

Result



Prompt:

Create an aircraft instrument landing system microcontroller that:

Implements an aircraft Instrument Landing System localizer, modeled using a finite state machine.

Manages vertical and horizontal positioning.

Includes safety measures for invalid control signals.

Estimate the total power, max frequency, and area of the design based on the Verilog code provided. Provide suggestions on how to improve PPA of the design.

[Gen Agent PPA]: Your response is ready!

****Power, Performance, and Area Estimation Report****

Power: 15 mW
Frequency: 1000 MHz
Area: 0.5 mm²
Number of gates: 12719
Number of flip-flops: 3345

****Assumptions:****

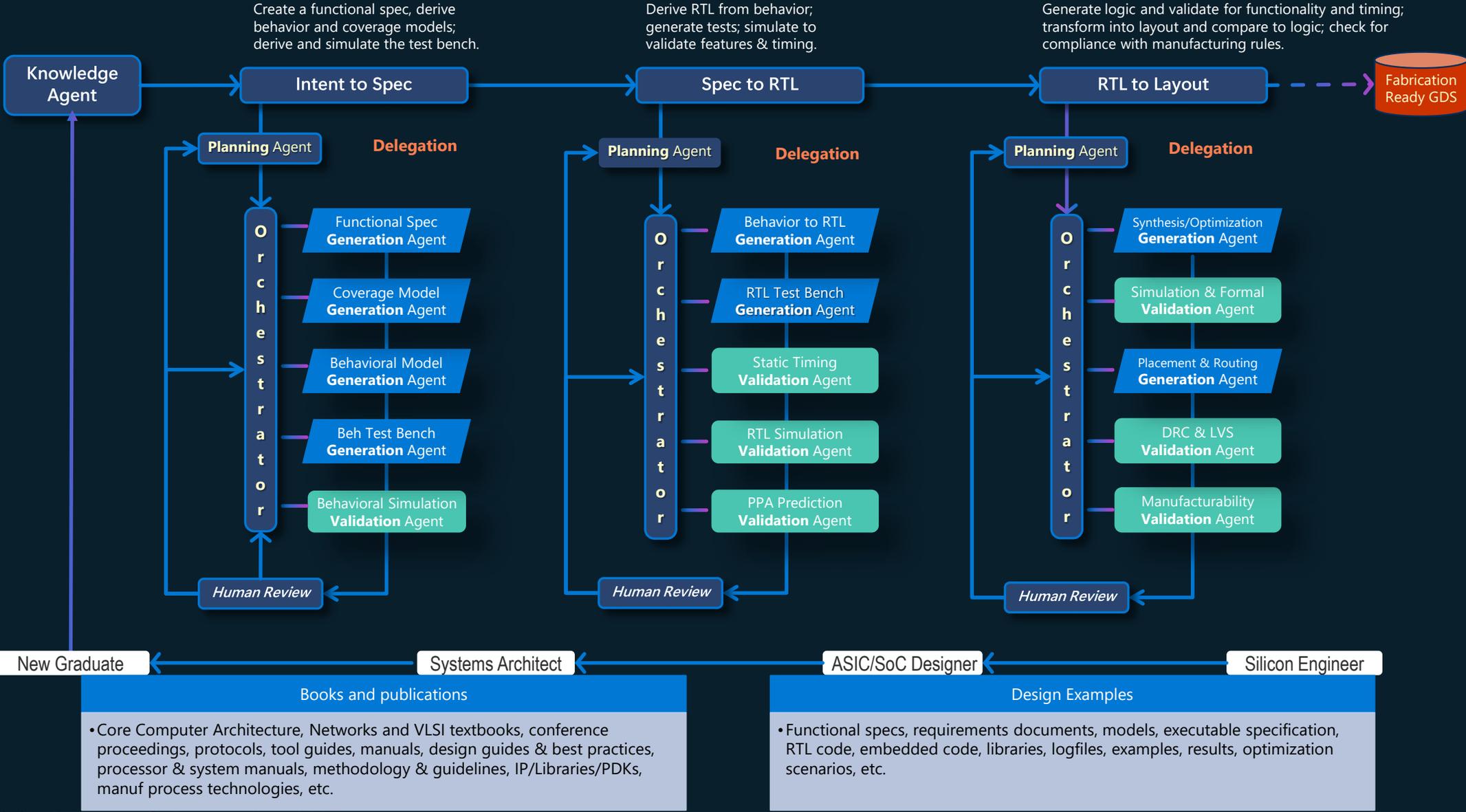
1. The design is synthesized using the Intel 18A process technology.
2. The signal toggle rate is assumed to be 30%.
3. The nominal operating conditions are 25°C temperature and 0.7V voltage.
4. The design includes 48,100 nets, which contribute to the interconnect power and area.
5. The power estimation considers both dynamic and static power components.

****Suggestions for Improvement:****

1. ****Power Optimization:**** Consider clock gating techniques to reduce dynamic power consumption by disabling the clock in inactive modules. Additionally, optimize the logic to reduce unnecessary switching activities.
2. ****Performance Enhancement:**** To increase the maximum frequency, critical path analysis and optimization can be performed. This may involve restructuring the logic to reduce the longest path delay.
3. ****Area Reduction:**** Explore logic optimization techniques such as logic folding and common sub-expression elimination to reduce the number of gates. Additionally, consider using more compact flip-flop designs or multi-bit flip-flops to save area.

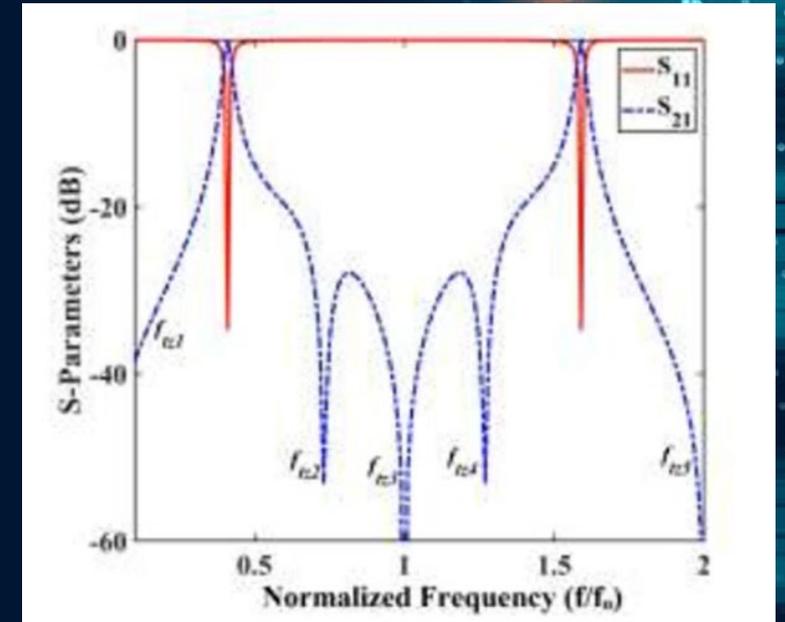
These suggestions aim to balance the trade-offs between power, performance, and area, which are critical in digital design.

Multi-Agent system for Silicon Design



Designing a filter

- Design a filter that passes 2.4 and 5.8 GHz with a notch at 4 GHz, with info on system impact of design choices and then optimize it for Reston and Seattle
- Specify the filter in detail
- Create the physical dimensions
- Analyze the spectrum conditions
- Buy the tunable components for Reston & Seattle spectrum
- Run the EM software by writing pyAEDT (Ansys)



Outputs

- ⌘ Correctly assumes that 2.4 and 5.8 GHz corresponds to WiFi, (Bluetooth also 2.4 GHz) and the 4 GHz notch is for radar interference
- ⌘ Choses a viable manufacturing path and suitable substrate
- ⌘ Backs out and assess a reasonable resonance quality
- ⌘ Correctly assumes propagation statistics with margin to get a working design
- ⌘ Gives you choices of where to put the filter and the Q for various location to do the filtering
- ⌘ Understands that the SNR depends on the modulation scheme and how much data you are trying to pack into the channel

target MCS just means: "Which Modulation and Coding Scheme are you aiming to support over the link?"

In Wi-Fi (802.11a/b/g/n/ac)

- Modulation type (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM)
- Coding rate (e.g., 1/2, 2/3, 3/4, 5/6, 6/8)
- Number of spatial streams
- Resulting data rate for the link

Why it matters for you

Each MCS index has a minimum SNR (in ballpark):

MCS (20 MHz)	Mod
MCS 0	BPSK
MCS 3	16-QAM
MCS 7	64-QAM
MCS 9 (ac)	256-QAM

If you tell me your target link budget

1. Determine the minimum SNR for the target MCS
2. Compare that to the SNR budget
3. From that, derive the maximum link loss budget
4. Use that IL budget to determine the maximum link length

Source: Bill Chappell

Great—locking on MCS 7 (64-QAM, 5/6) clarifies

Here's the tight answer, then the math so you can

TL;DR

- At 2.4 GHz, 300 m, isotropics, NF=2 dB, Pt: With an SNR target of 24 dB, you've got ~5. that leaves ~2.4 dB total RX loss budget for
 - Channel-select ($\approx 20\text{--}24$ MHz BW): For need unloaded $Q_0 \approx 1.2\text{k--}0.9\text{k}$. → Use 5
 - Band-select (≈ 100 MHz BW for the whole need $Q_0 \approx 425\text{--}280$ → microstrip on low on ~20 mil RF laminate.
- At 5.8 GHz, same assumptions give link SNR 7. Even a lossless filter won't fix that. You'll need add, say, +3 dBi at each end, you recover ~1 look like the 2.4 GHz case, just with slightly l

The numbers (so you can sanity

Link budget (20 MHz)

- FSPL(dB) = $32.44 + 20 \log_{10}(f_{\text{MHz}}) + 20 \log_{10}(d_{\text{km}})$
 - 2.4 GHz @ 0.3 km → 89.6 dB
 - 5.8 GHz @ 0.3 km → 97.3 dB
- Thermal noise with NF=2 dB:

or a Wi-Fi-6E-class BAW (Akoustis A10158 series) but note those tend to be wideband (UNII blocks) rather than single-channel. [minicircuits.com](#) [rfmw.com](#)

Want me to assemble a short test coupon schematic around these (SMA launches, pads, stub for the 4 GHz notch, bias tees), or pull current stock and lead-times?

URLs

- Qorvo QPQ1909 product page: <https://www.qorvo.com/products/p/QPQ1909> [qorvo.com](#)
- Qorvo QPQ1909 datasheet: <https://www.qorvo.com/products/d/da006717> [qorvo.com](#)
- Mini-Circuits CBP-5800AG+ product page: <https://www.minicircuits.com/WebStore/modelSearch.html?model=CBP-5800AG%2B> [minicircuits.com](#)
- Mini-Circuits CBP-5800AG+ datasheet: <https://www.minicircuits.com/pdfs/CBP-5800AG%2B.pdf> [minicircuits.com](#)
- Digi-Key listing CBP-5800AG+: <https://www.digikey.com/en/products/detail/mini-circuits/CBP-5800AG/19285247> [DigiKey](#)
- Mini-Circuits ZVBP-5800-S+ cavity BPF (series datasheet ref): <https://www.minicircuits.com/pdfs/ZVBP-5800-S%2B.pdf> [minicircuits.com](#)
- Mini-Circuits filter catalog (custom notch quotes): <https://www.minicircuits.com/WebStore/RF-Filters.html> [minicircuits.com](#)
- Anatech RF filters (custom Wi-Fi notch/BPF): <https://anatechelectronics.com/> [Anatech Electronics](#)
- MPG (custom wireless system notch filters): https://www.mpgdover.com/content/dam/mpg/documents/catalogs/product_catalog-klm.pdf [mpgdover.com](#)

If you want me to bias toward only SMT (no cavities), I can swap the 5.8 GHz pick for a BAW Wi-Fi-6E coexistence filter (e.g., Akoustis A10158) and recompute your IL/SNR budget.



MIT report finds 95% of enterprises see no return on generative AI

Agent Management

- ⌘ **Governable:** Manage agents and their lifecycle, control their access, and analyze their behavior.
- ⌘ **User-friendly:** Tasks should be accomplished without undue friction.
- ⌘ **Auditable:** Distinguish agentic actions from those taken directly by users.
- ⌘ **Revocable:** Agentic access can be revoked without affecting the user's access.
- ⌘ **Deployable:** Build on existing infrastructure to quickly bring options to the marketplace.
- ⌘ **Scalable:** Support large numbers of agents and high rates of creation/deletion.
- ⌘ **Reliable:** Ensure safe deployment practices for agents.
- ⌘ **Safe:** Support agentic workflows without compromising security or reliability.
- ⌘ **Managed Identities:** Agent authentication should not require end users, installers or administrators to handle keys or other secrets
- ⌘ **Least-Privileged Access:** Agents should have the minimum permissions necessary

Announcing

Introducing Copilot Studio

Adaptive planning and cognition in the loop

Graph-based data indexing for reasoning

Enterprise-grade, M365 integration

Microsoft Discovery

 Chemistry

New compounds
and materials

 Life sciences

AI-driven
drug discovery

 Physics

Semiconductors and
multi-physics systems
development

 Others

Platform approach for
new science verticals

 Agentic enterprise platform for R&D

Copilot for science • Graph-based reasoning • Multi-agent orchestration

 AI

Azure AI Foundry

 Compute

Azure HPC • Azure Quantum

 Data

Microsoft Fabric • Azure Purview

What's Next

- ⌘ Persona based approaches
- ⌘ Persistence
- ⌘ Agent granularity
- ⌘ Alignment & Trust
- ⌘ AGI/ASI

Agents in the Enterprise

Build for the enterprise, not the project

Address the silos in your enterprise

Workflows will need to evolve

Build a process for continuous evaluation and refinement

Partner for the difficult stuff

Agents can augment specialized skills

Agents will be part of your workforce

The future is composable

Productivity

ROI & TTM

Transformation