Ultra Wide Band Gap (UWBG) materials are considered to be the fourth generation of semiconductor materials, those material have band gaps higher than $4.00\,eV$.

Examples of UWBG materials are: C-BN($6.4\,eV$), AlN($6.0\,eV$), and Diamond($5.5\,eV$).

Advantages:
Much greater power and RF capabilities for a greener future and better connectivity (e.g., 6G-7G).
Can be used for UV photonics for pandemic prevention and space exploration.
Can host a photonic platform for quantum information and science.

We can build a CMOS out of an UWBG semiconductor, and KAUST did that in 2021 with Ga_2O_3.

UWBG materials can be integrated in a heterogeneous manner, vertically. This revolutionized idea will change the way that we make chips, we will be able to build chips vertically like a LEGO!

Has a minimum on/off loss ratio compared to other semiconductors

Q: How does it relate to electric cars?

UWBG semiconductors can be used to improve the chips in electric cars, for example reducing the power motor size, power loss by 70%! One hour of the conventional chip will lose power to an equivalent of 1 million hour of UWBG material!

Q: What are the advantages of developing the local semiconductor, electronics, and chips industry in KSA?

We will be able to self-suffice our local need for semiconductor chips, especially with the raising local market for electrical cars. Also, the market has a huge demand for semiconductors, and KSA can benefit from that economically.