

Silanna Ultraviolet Light Emitting Diodes

2022

- Privately funded 2006
- Semiconductor technology focus
- From research through development to commercialisation
- History
 - **2006 – Silanna formed to develop and commercialise high performance, non-volatile memory**
 - **2008 – Sydney wafer fab acquired from Peregrine Semiconductor Corporation**
 - **2010 – New Fab commissioned – with Molecular Beam Epitaxy**
 - **2020 – Commence construction of new global Headquarters building from Pinkenba, Brisbane**



- 2014 –Sponsored Caterham F1 Team
- 2015-2018 – Sponsored Sauber F1 Team

Incubation of new technology businesses (from concept to commercial success)

RF *Industry leading RF switches (on SOI) – Acquired by Qualcomm*

Isolation *World's first high speed USB 2.0 isolators (on SOS)*

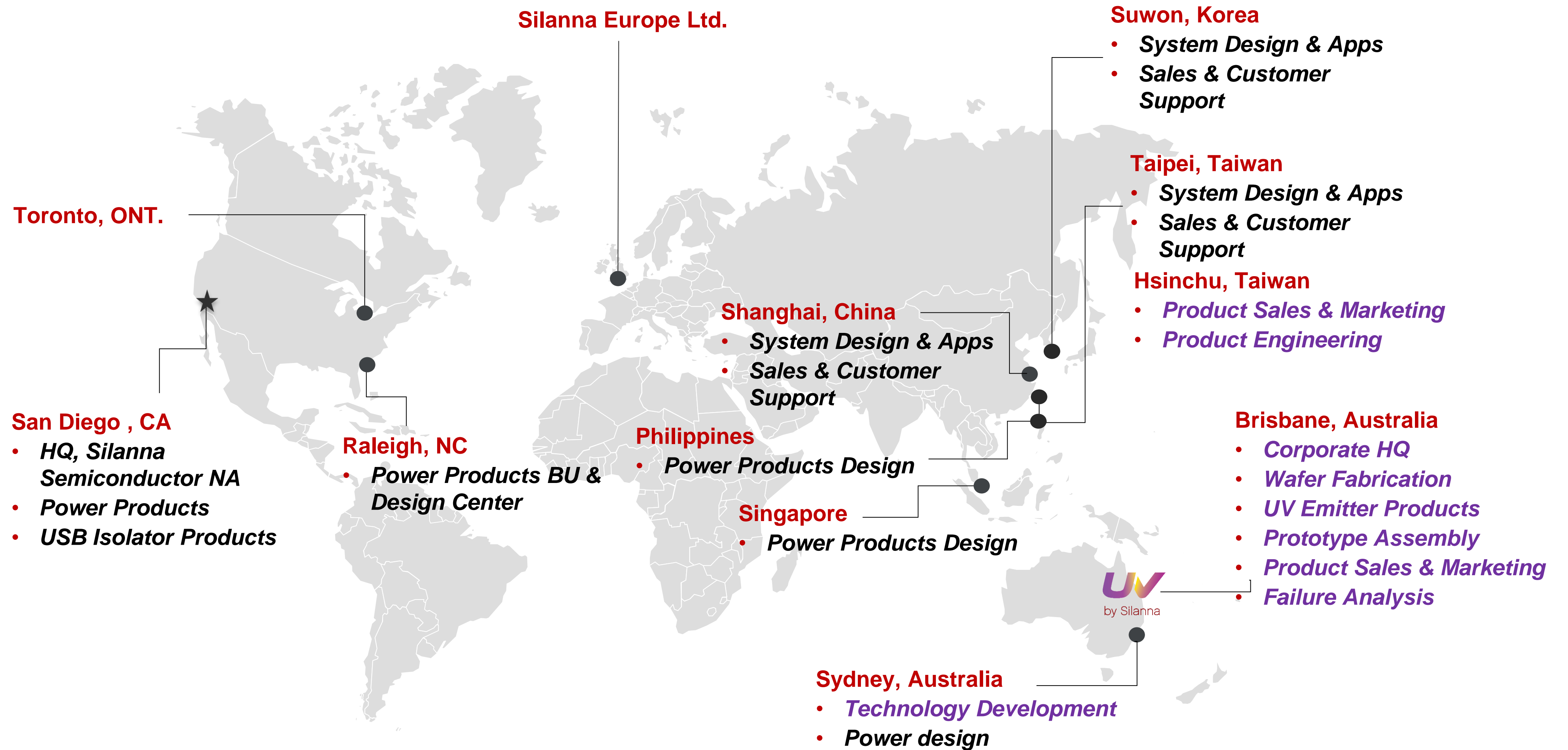
Power *Industry leading power switches (on SOI)
High voltage power switches*

Substrates *High thermal conductivity substrates*

UV emitters *Industry leading UVC Light Emitting Diodes*

Foundry *Prototyping and production on SOS, SOI, etc*





- Situated on a 15,000 m² Brisbane riverfront site in Pinkenba, Brisbane
- 100mm compound semiconductor epitaxy production fab, with 925m² class 100-10,000 cleanrooms
- Research lab in Adelaide

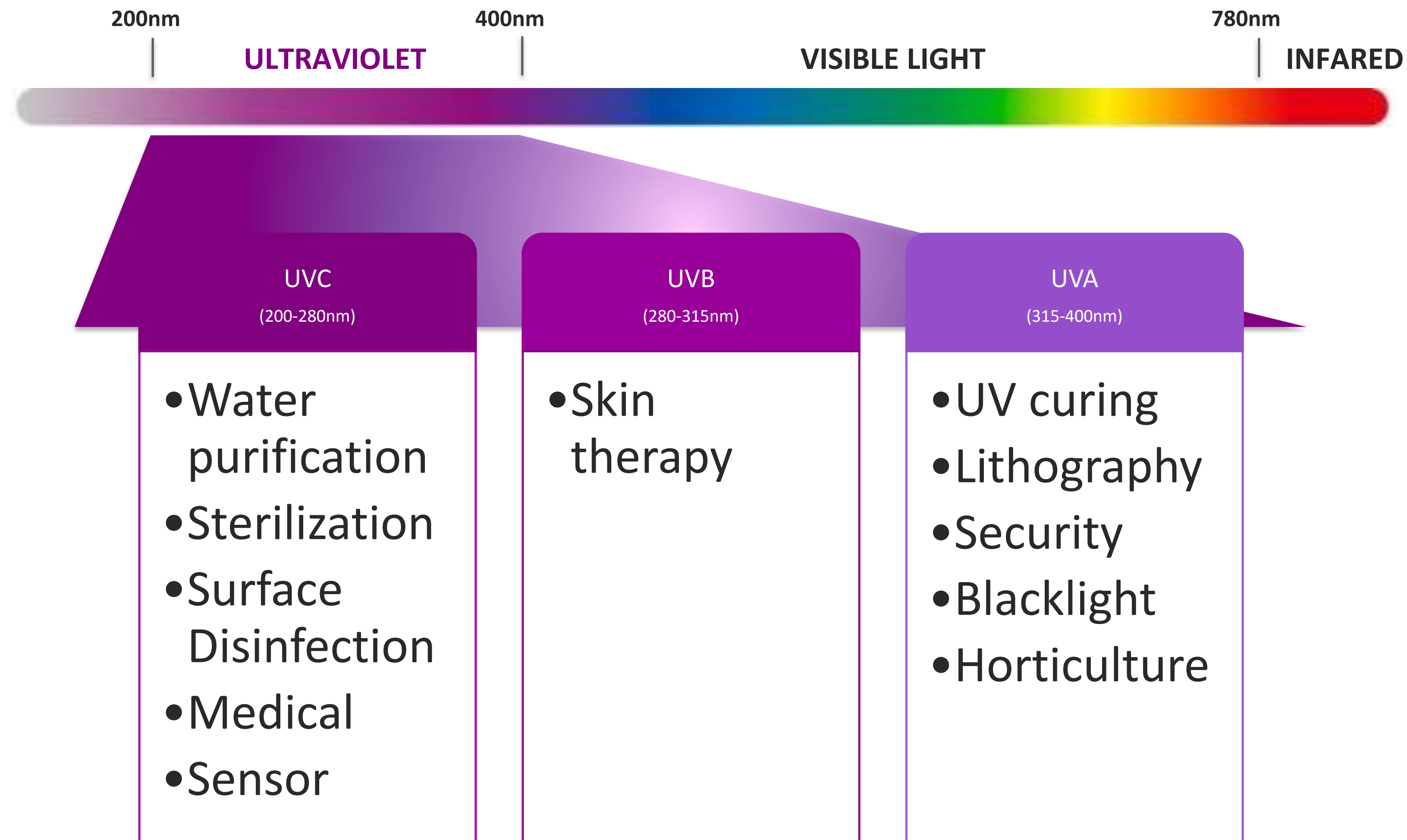


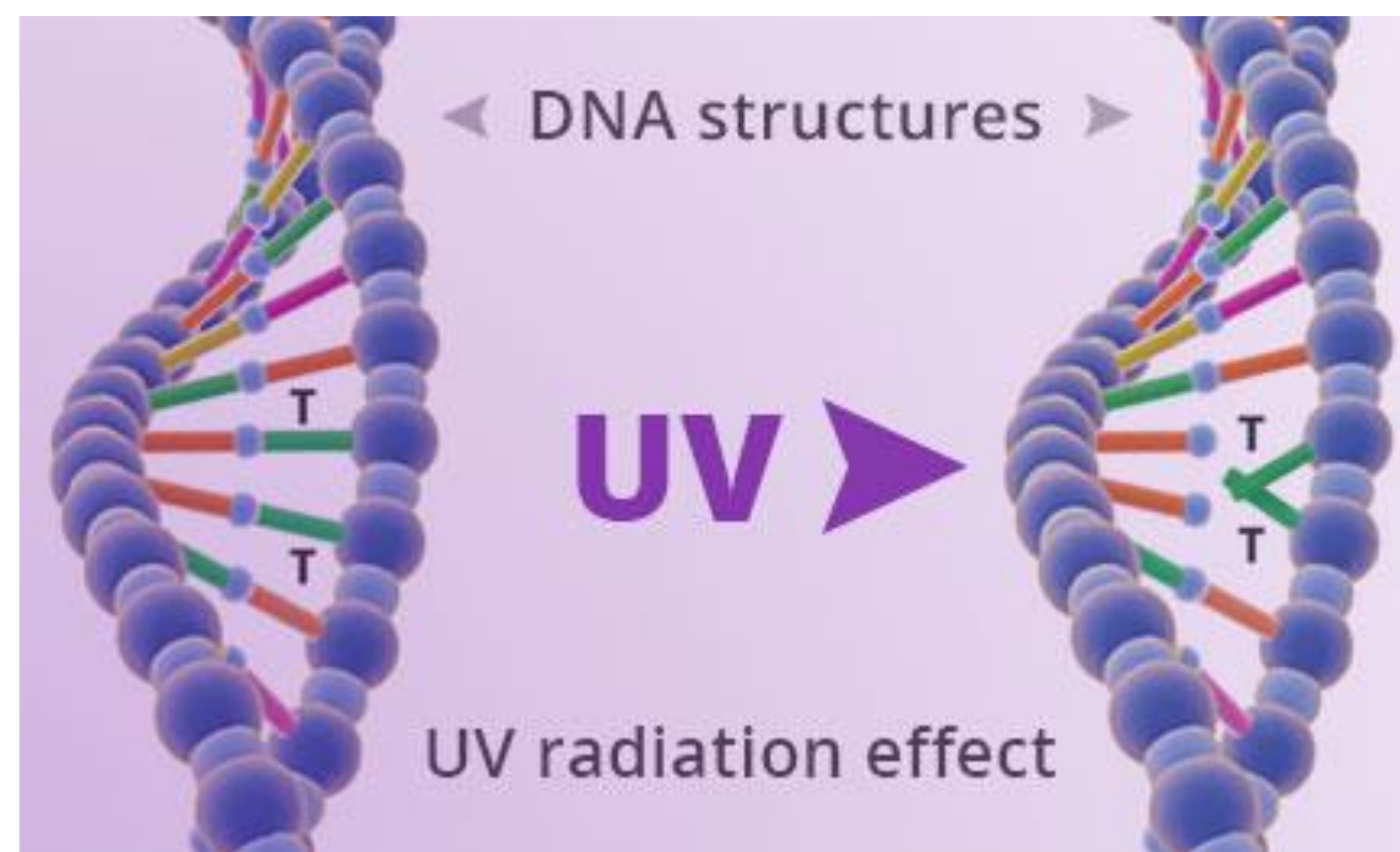
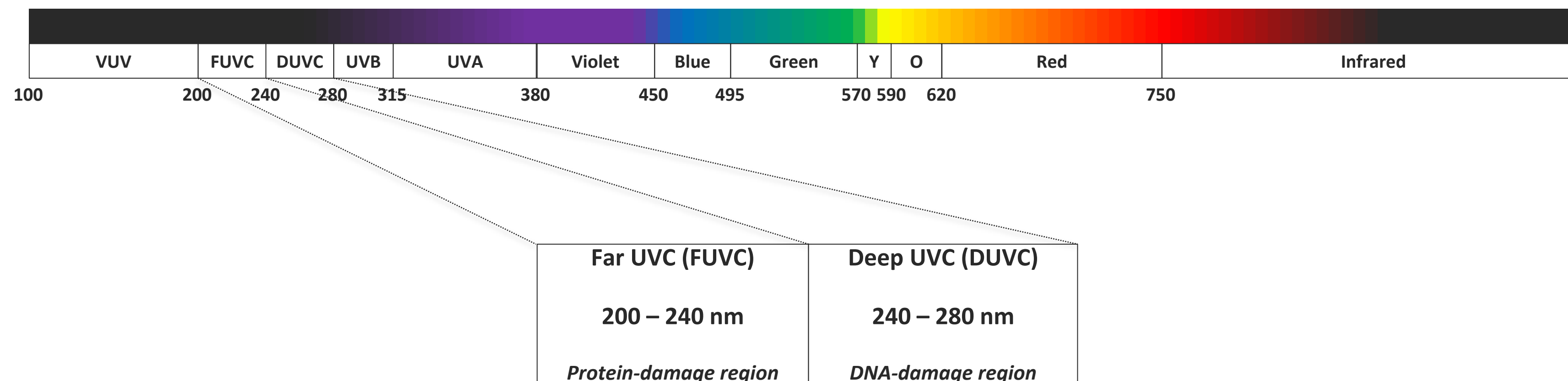
- ISO 9001:2015 LRQA certification
- US Defence MicroElectronic Activity (DMEA) Trusted Foundry clearance to “secret” level



Silanna UVC LEDs

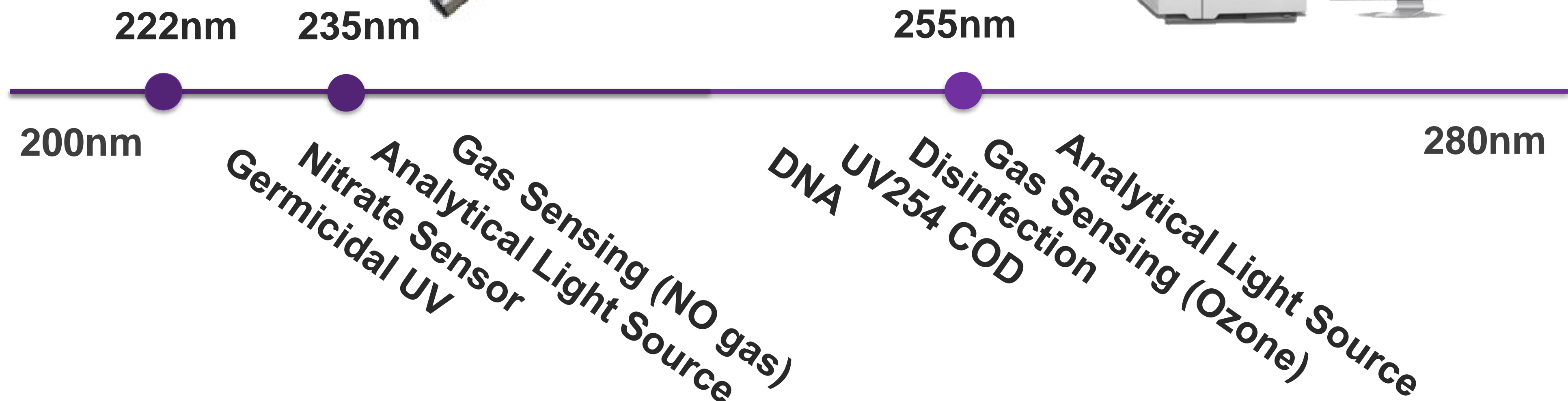
UV wavelength definition





With sufficient dose, UVC light will deactivate any microbe (virus, bacteria, protozoa, mold, fungus, etc.)

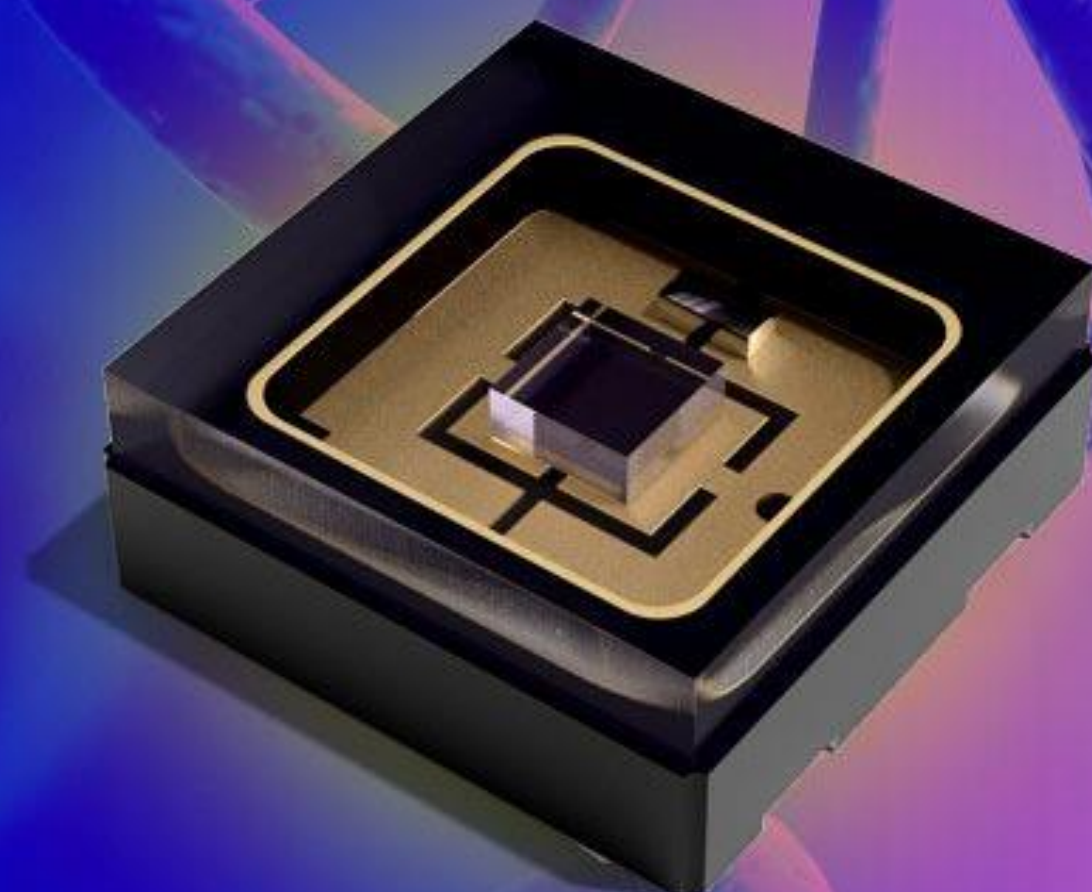
Near UVC & Far UVC LED applications



DUVC & FUVC Light source Comparison

Light source Type	Deuterium lamp	Xenon flash lamp	LED Solution
Wavelength	185-400nm	185 to 2000nm	235nm/255nm
Power consumption	30W	2W	0.12W
Warm-up Time	20 second +	Instant	Instant
Typ. Lifetime (L50)	1,000hrs	1 X 10 ⁹	L50 2,000hrs /L50 10,000hrs
Module	Yes	Yes	Option
Lamp Cost (USD)	\$400~\$700	\$700~900	Lower
Photo			





255nm Deep UV-C LED

Disinfection • Water Quality Monitoring
Gas Sensing • Biological Analysis

Features

- **Deep Ultraviolet LED**
- Small Footprint
- ESD protection
- Mercury Free

Applications including

- Water quality monitoring
- Gas Sensing
- Liquid Chromatography
- Chemical and biological analysis
- Disinfection

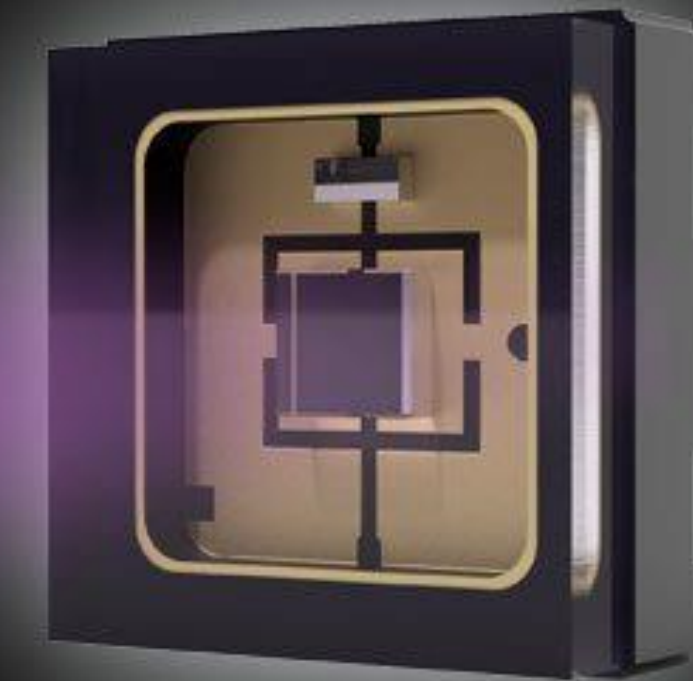
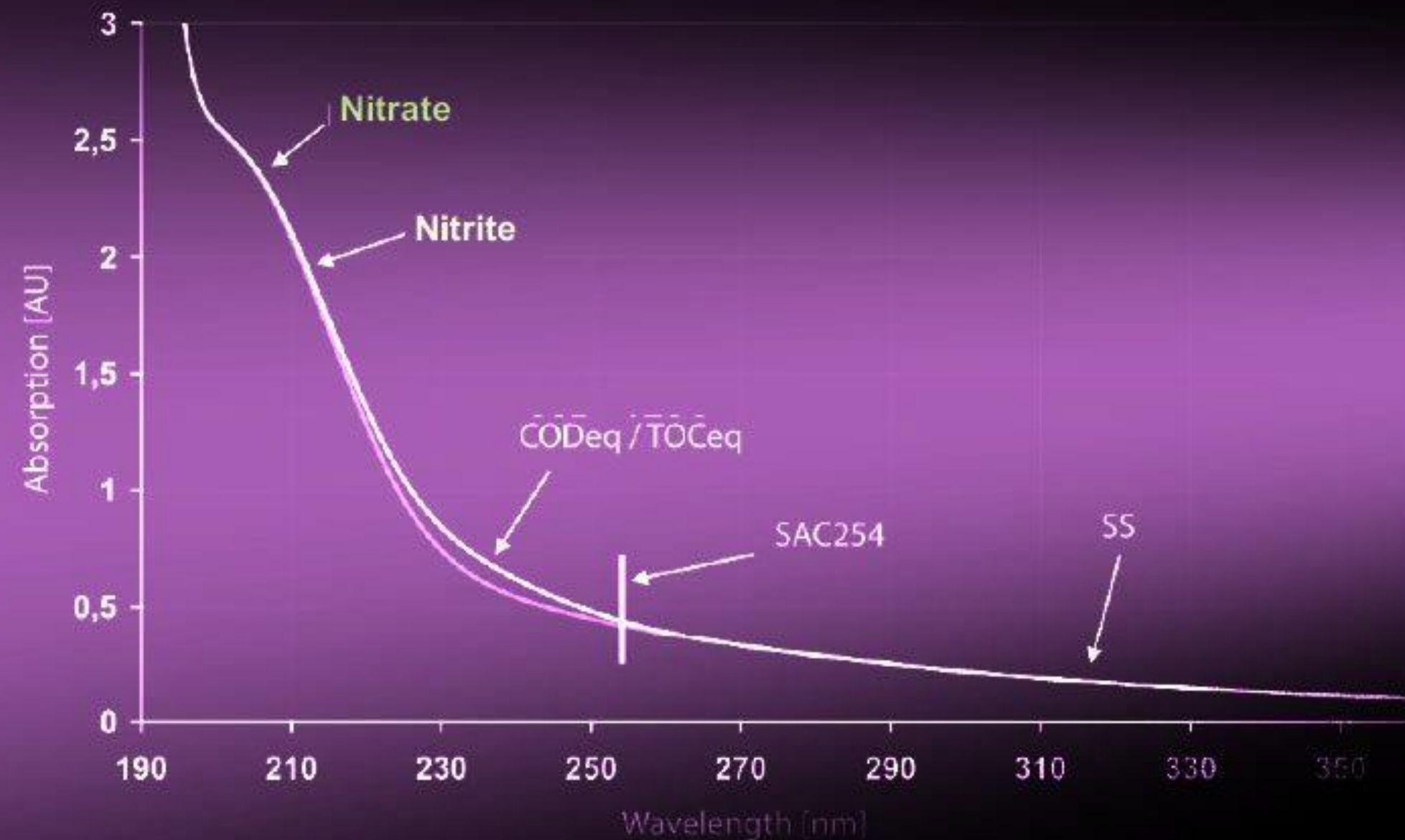
SN3 255nm LED characteristics

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Peak wavelength	λ	250	255	260	nm	1, 2
FWHM	FWHM	-	12	18	nm	1
Radiant flux	P_{OUT}	0.5	0.8	-	mW	1, 3
Forward voltage	V	5	-	7	V	1, 4
Viewing angle	degree	-	120	-		1
Power dissipation	P_D	-	0.12	-	W	1

Test conditions:

1. T = 25°C ambient, T_{solder point} = 25°C with Peltier controlled heatsink, Forward Current = 20mA, 10ms integration time
2. Wavelength measurement accuracy is ± 2.0 nm
3. Radiant flux measurement accuracy is $\pm 10\%$
4. Forward voltage accuracy is ± 0.2 V

Absorption spectrum with/without LODeq



235nm Far UV-C LED

Features

- **Far Ultraviolet LED**
- Small Footprint
- ESD protection
- Mercury Free

Applications including

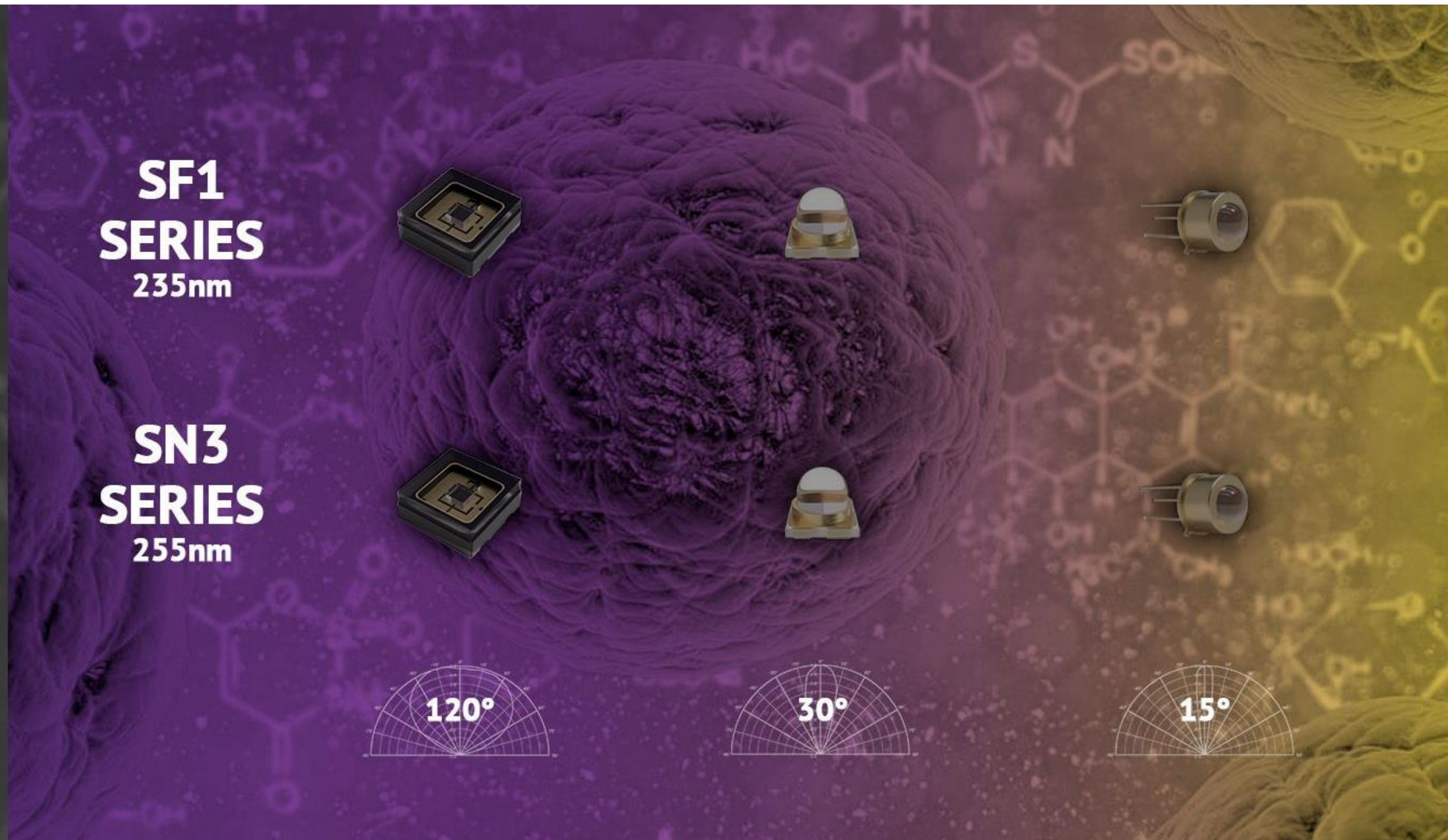
- Water quality monitoring
- Gas Sensing
- Liquid Chromatography
- Chemical and biological analysis
- Disinfection

SF1 235nm LED characteristics

Parameter	Symbol	Min	Typ	Max	Units	Test Conditions
Peak wavelength	λ	230	235	240	nm	1, 2
FWHM	FWHM	5	10	15	nm	1
Radiant flux	P_{OUT}	0.05	0.5	-	mW	1, 3
Forward voltage	V	6	7	8	V	1, 4
Viewing angle	degree	-	120	-		1
Power dissipation	P_D	-	0.14	-	W	1

Test conditions:

1. T = 25°C ambient, Tsolder point = 25°C with Peltier controlled heatsink, Forward Current = 20mA, 10ms integration time
2. Wavelength measurement accuracy is ± 2.0 nm
3. Radiant flux measurement accuracy is $\pm 10\%$
4. Forward voltage accuracy is ± 0.2 V



The central image features a large, textured purple sphere with a complex, organic surface. Surrounding this sphere are six UV LED components: two square chips (SF1 and SN3 series) and four cylindrical components (two SF1 and two SN3). The background is a gradient of purple and yellow, overlaid with faint chemical structures. At the bottom, three semi-circular diagrams illustrate beam angles: 120°, 30°, and 15°.

**SF1
SERIES**
235nm

**SN3
SERIES**
255nm

120°

30°

15°

Thank you