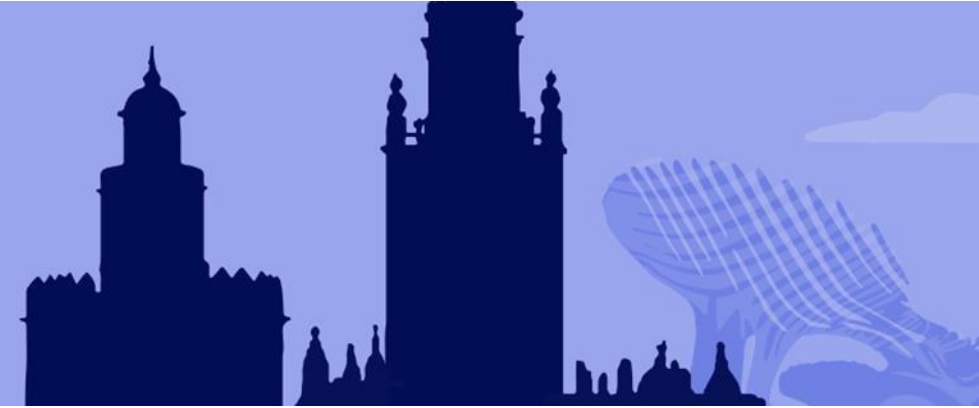




ACCEDE | ESCCON 2025

Seville - Spain
25 to 27th March



EPOSIC – European Power SiC

Jutta Heinzelmann (Infineon Technologies AG)

26.03.2025



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Infineon is a global leader in power systems and IoT

Global leader

in automotive, power management,
energy efficient technologies and IoT

~58,060

employees¹

Market position

Automotive

#1

TechInsights,
April 2024

Power

#1

Omdia,
October 2024

Microcontroller

#1

Omdia,
March 2025

¹ As of 30 September 2024



Infineon at a glance

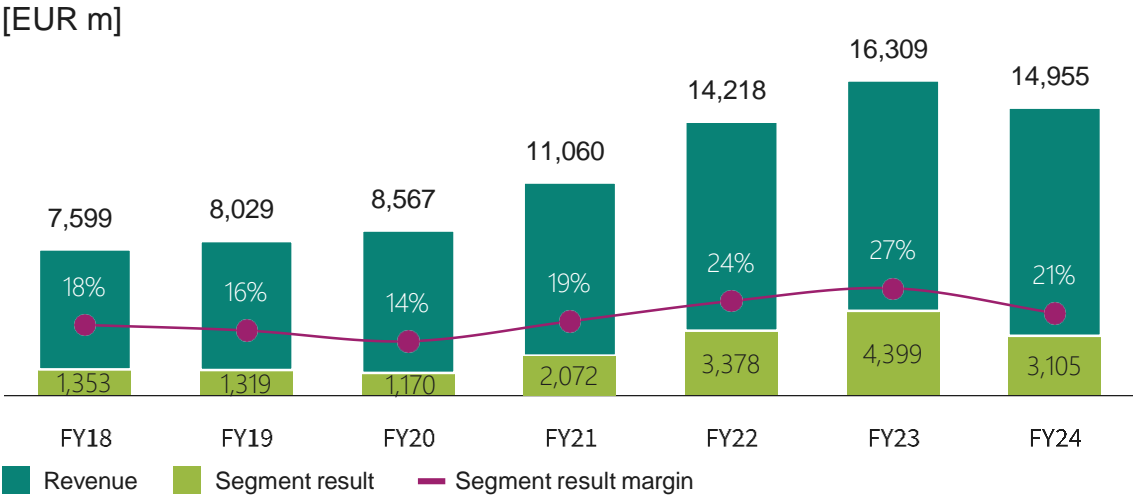
Growth areas

Energy
green and efficient

Mobility
clean and safe

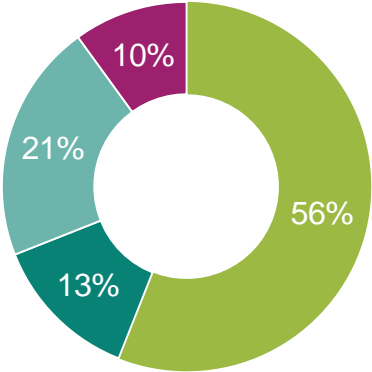
IoT
smart and secure

Financials



FY24 revenue by segment¹

- Automotive (ATV)
- Green Industrial Power (GIP)
- Power & Sensor Systems (PSS)
- Connected Secure Systems (CSS)

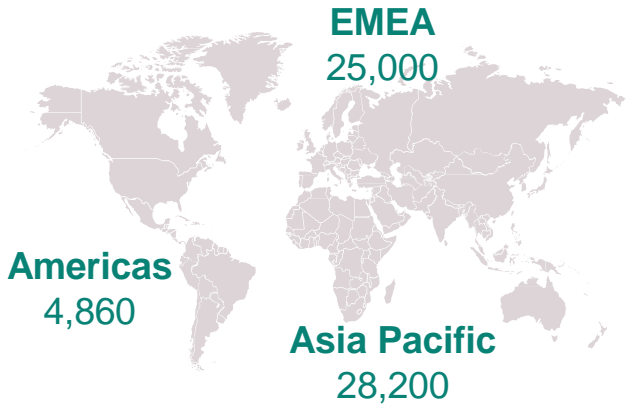


Employees¹

58,060
employees worldwide

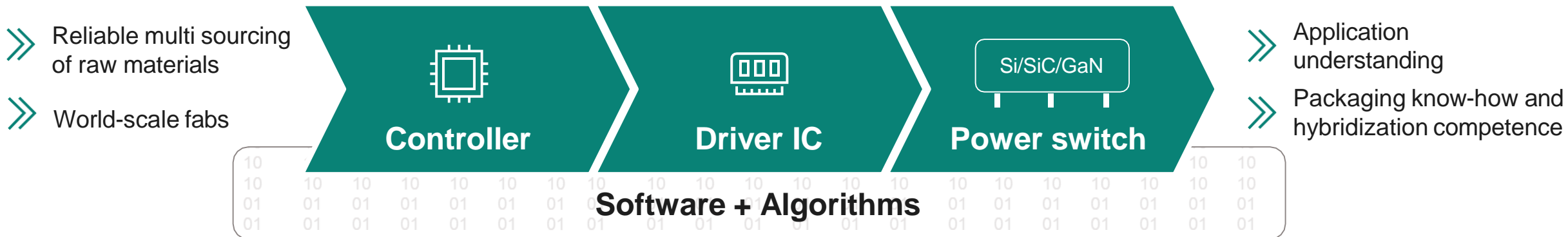
71
R&D and

15
manufacturing locations²



For further information: [Infineon Annual Report](#).
¹ 2024 Fiscal year (as of 30 September 2024) | ² As of 30 September 2024

Infineon leading in power systems – mastering all three key materials



Leadership in Power Systems across all materials and technologies

Silicon

Diode – MOSFET – IGBT – Driver – Controller



Silicon carbide

Diode – MOSFET



Gallium nitride

HEMT – Driver

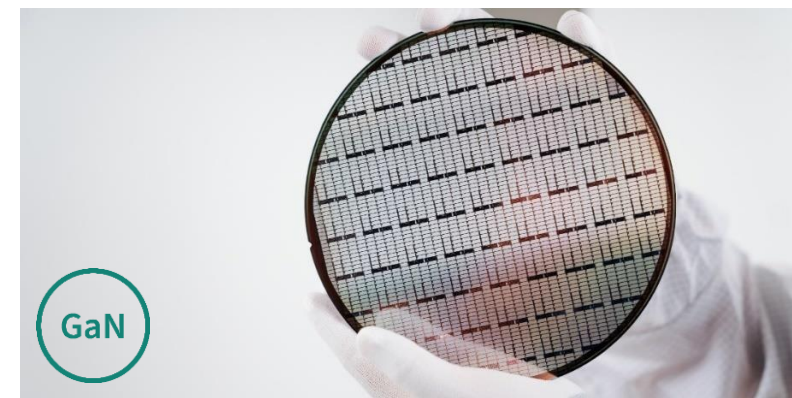
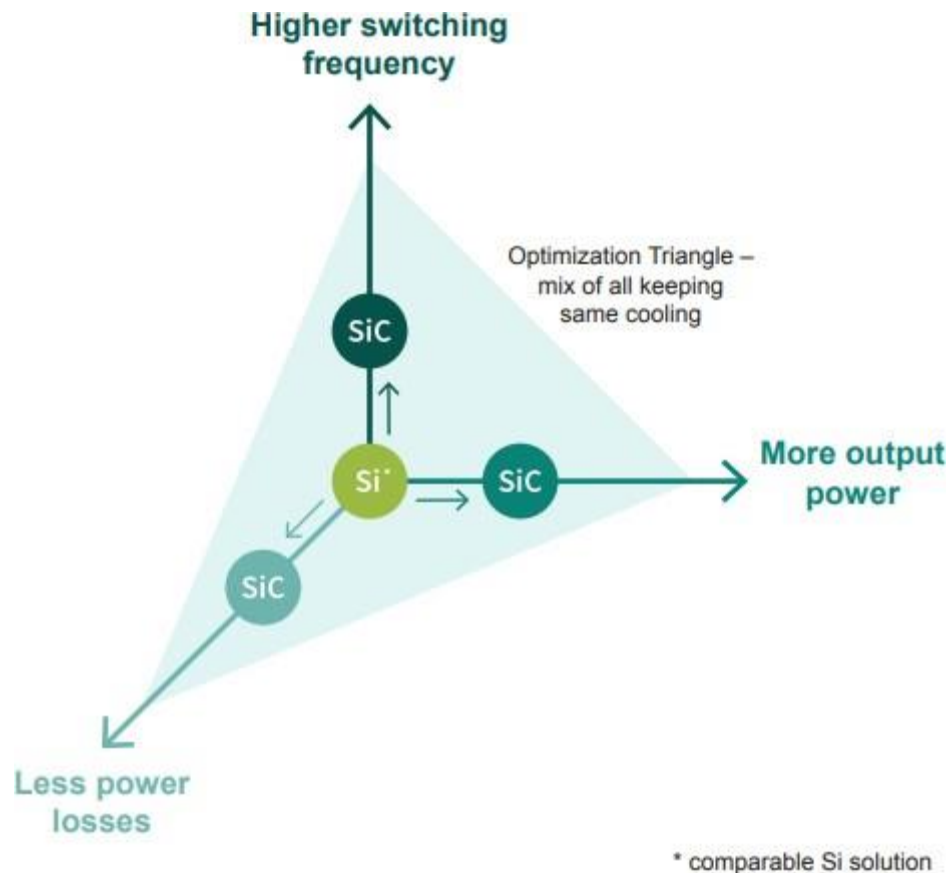


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Why SiC? Customer can choose how to optimize their system!



Choose the optimum for your system:

- Increase switching frequency with the same output power and total losses (keeping same cooling conditions)
 - Reduce passive components
- Get more output power with the same switching frequency and total losses (keeping same cooling conditions)
 - Higher performance
- Reduce the losses with the same switching frequency and same output power
 - Better lifetime (keeping same cooling conditions)
 - Saving on cooling (with the same lifetime)

... get the benefit with most value for you

...or combine a bit of all

EPOSIC project background and scope

Project Background	Technological need
<p>EPOSIC: “European Power SiC Supply Chain”</p> <p>Project set-up by ESA as part of the GSTP Component “EEE Space Component Sovereignty for Europe”</p>	<p>Trend to increase power bus operating voltage for large electrical platforms up to 300V</p> <p>→ performant Power MOSFET operating reliably at 300V @ high junction temperature required</p>
Objectives	Requirements
<p>Development, evaluation & qualification (ESCC) of a European SiC switching technology suitable for space applications:</p> <ul style="list-style-type: none"> – Radiation Hard (SEE & TID) SiC MOSFET – Power module in half-bridge configuration 	<ul style="list-style-type: none"> – VDS range: 300 V to 500 V (free of SEB/SEGR) – Current range: 20 A to 50 A – Reliable and high performance at $T_j = 175^{\circ}\text{C}$ to 200°C – Radiation hardness: <ul style="list-style-type: none"> – 100 krad (TID), LET 62 MeV/mg/cm² (SEE) – Non hermetic module with $P > 10\text{kW}$

EPOSIC timeline

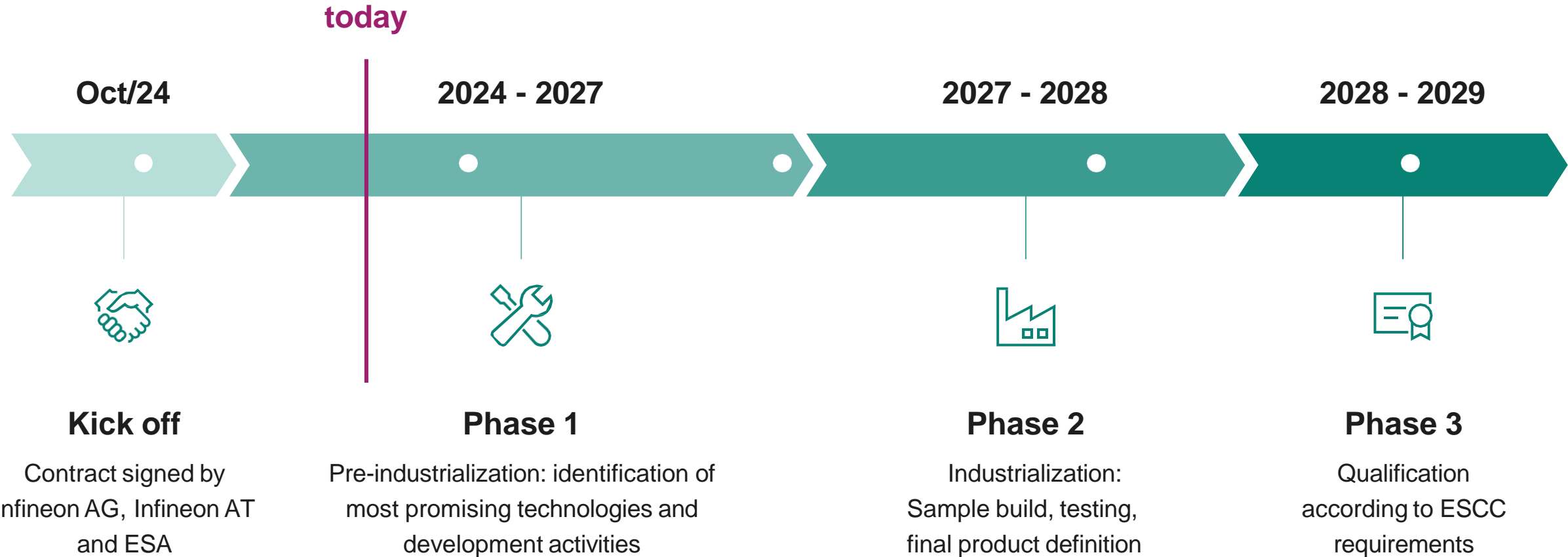


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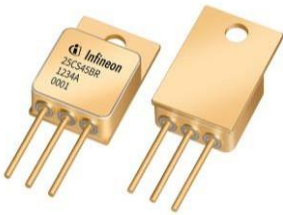


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Infineon radiation hardened products

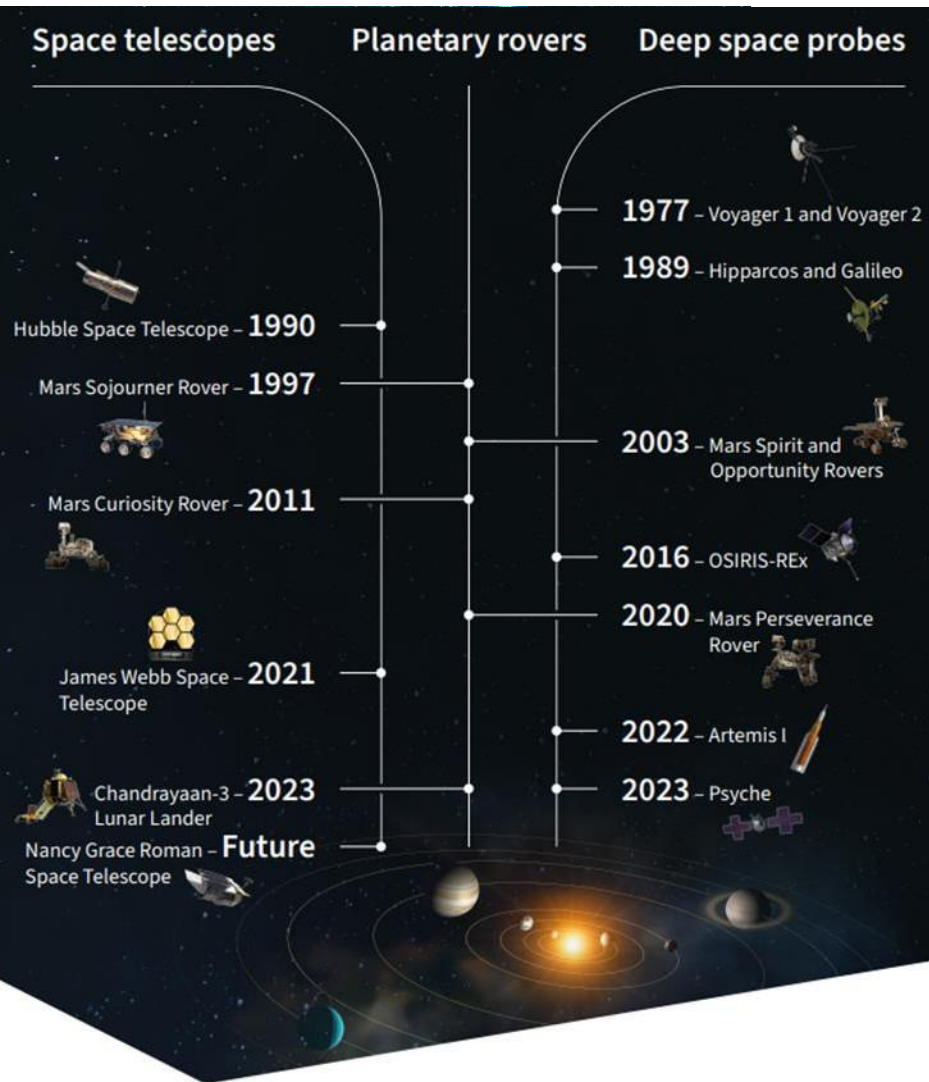
- Infineon offers a wide range of ESA certified parts for space applications
 - N-channel power MOSFET from 60V to 650V
 - RF components to support S, L, C, X-band



- Parts are available in hermetic packages or as bare die

Package	Micro-X	SMD0.5	SMD2	TO254AA	TO257	Die
Picture						
Size [mm x mm]	1.7 x 1.7	7.5 x 10.2	13.3 x 17.5	13.7 x 20.2	10.6 x 16.5	various
Product	RF	Power	Power	Power	Power	Power, RF

Infineon has more than 50 years of space heritage



RF and power devices from Infineon are part of many missions

- First order for RH RF component received in 1977!
- Some examples in alphabetical order
 - Alphasat (Joint ESA/Inmarsat communications satellite)
 - Artemis (Advanced Relay And Technology Mission, ESA)
 - JUICE (Jupiter Icy Moons Explore, ESA, 2023)
 - Intelsat (Communication, commercial)
 - IRNSS (India Regional Navigational Satellite System, ISRO)
 - Galileo NG (Satellite navigation system, ESA, 2014-2024)
 - GPSII (Global Positioning System, NASA)
 - Mars Rover (Exploration, NASA)
 - Meteosat SG (Weather monitoring & forecasting, ESA/EUMETSAT)
 - Sentinel (Earth observation, ESA)

Infineon has more than 25 years of field experience with SiC products

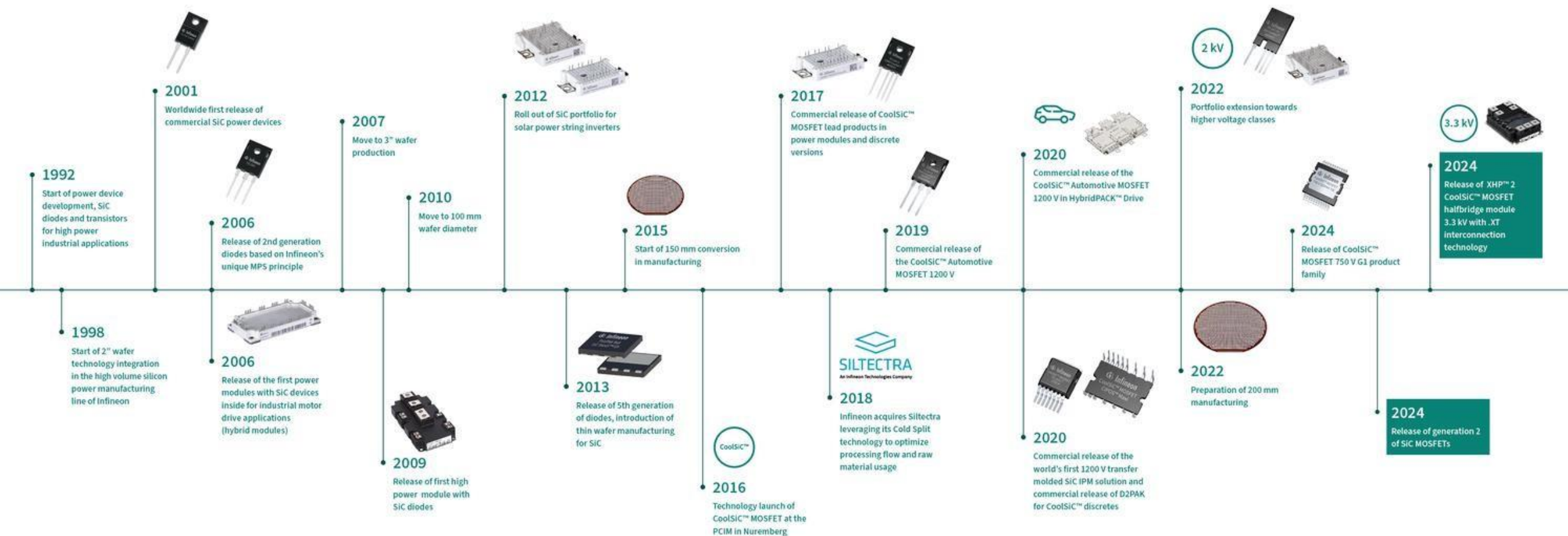
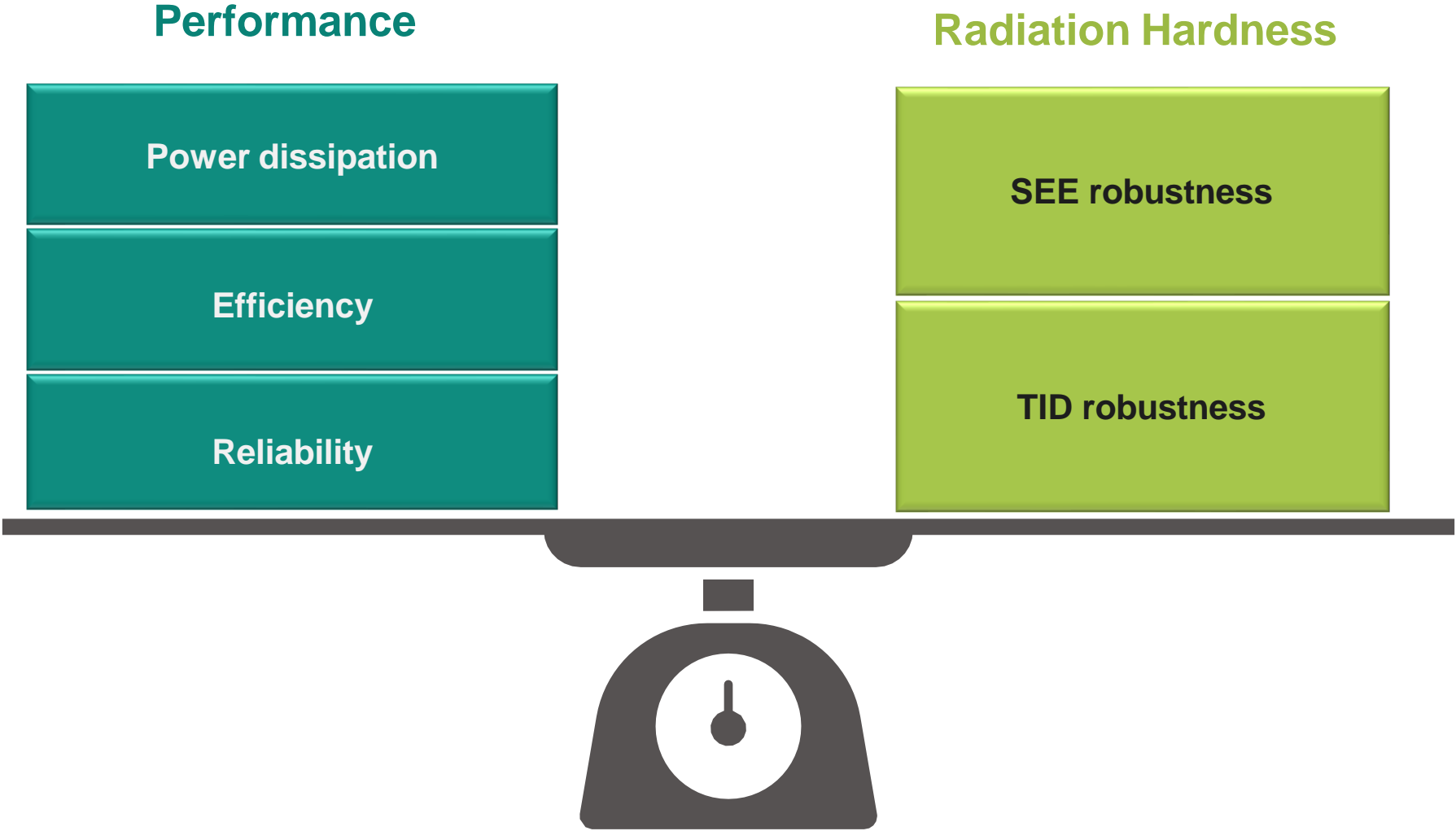


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Possible trade-offs for a RH SiC technology



List of packaged products to be evaluated








Product description	Chip	Package	Type	VD	T _j	Qualification	
Half Bridge	SiC	XHP™2	frame	3300V	-40 - 175°C	Industrial	
Half Bridge	SiC	62mm	frame	2000V	-40 - 175°C	Industrial	
Half Bridge	SiC	EasyPACK™ 1B	frame	1200V	-40 - 150°C	Automotive	
Half Bridge	IGBT	HybridPack DSC	plastic	700V	-40 - 150°C	Automotive	
Discrete	SiC	TO247	plastic	1700V	-55 - 175°C	Industrial	
Discrete	SiC	D2PAK-7	plastic	1700V	-55 - 175°C	Industrial	
Discrete	Si	SMD2 / SMD05	hermetic	650V	-55 - 150°C	ESCC	

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Summary



- European supply chain



- 25 years of experience with commercial SiC technology



- Successful development of radiation hardened PowerMOS under the ECI program together with ESA and DLR

European
SiC
technology
suitable for
space applications

