



# 600 V & 650 V CoolMOS™ 8 SJ MOSFET

April 2025



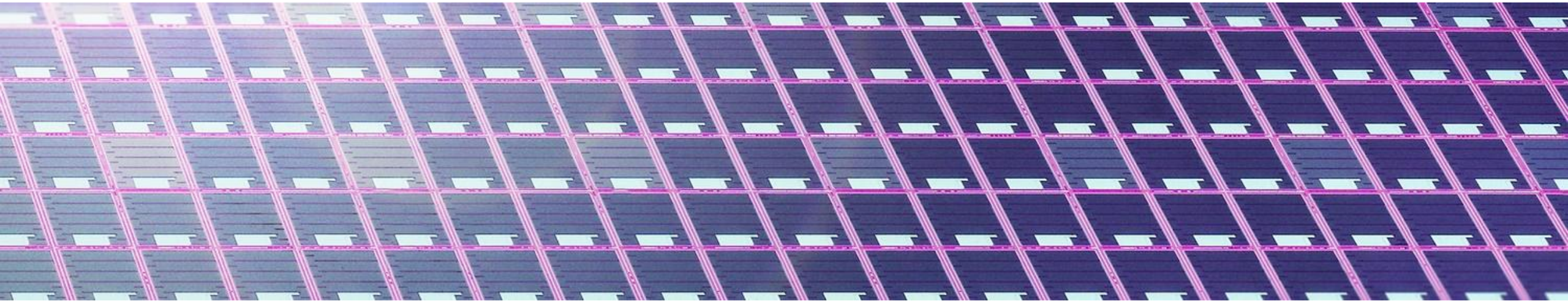
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# Depending on application requirements the 600-650 V Si, CoolSiC™ and CoolGaN™ have specific value propositions



## CoolIMOS™ SJ MOSFET

- Best price/performance for most efficiency requirements
- Well known technology leadership
- Mature, stable, well established
- Largest SJ MOSFET portfolio on the market with broad SMD offering

## TRENCHSTOP™ IGBT

- Provides high flexibility as applicable across all power ranges
- Well known technology with decades of track record
- Low device cost
- Broad range of chips and modules available

## CoolSiC™ MOSFET

- Enables new levels of power density and performance
- Highest thermal conductivity
- Simpler topologies possible
- Smaller device footprint

## CoolGaN™ HEMT

- Enables new horizons in power supply applications and audio fidelity
- Real zero reverse recovery
- Optional integration on chip level enables system integration



# High voltage focus applications

Driving profitable growth over the next years. Especially new applications e.g. S4, renewables & AI



Telecom rectifier



Server SMPS



Residential solar +  
Energy storage



Charger & adapter



EV charging

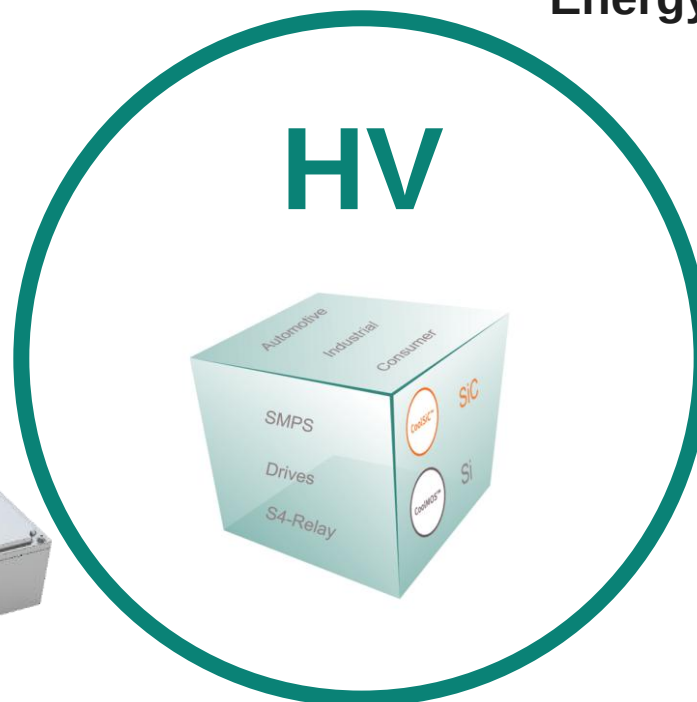


Solid state circuit  
breakers



Major home  
appliance

On-board  
Charger



# CoolMOS™ 7 & 8 support large scale & flexible production landscape to enforce resilience in times of growing demand for semiconductors

7 CoolMOS™ locations<sup>1</sup> for:

## Supply flexibility and security

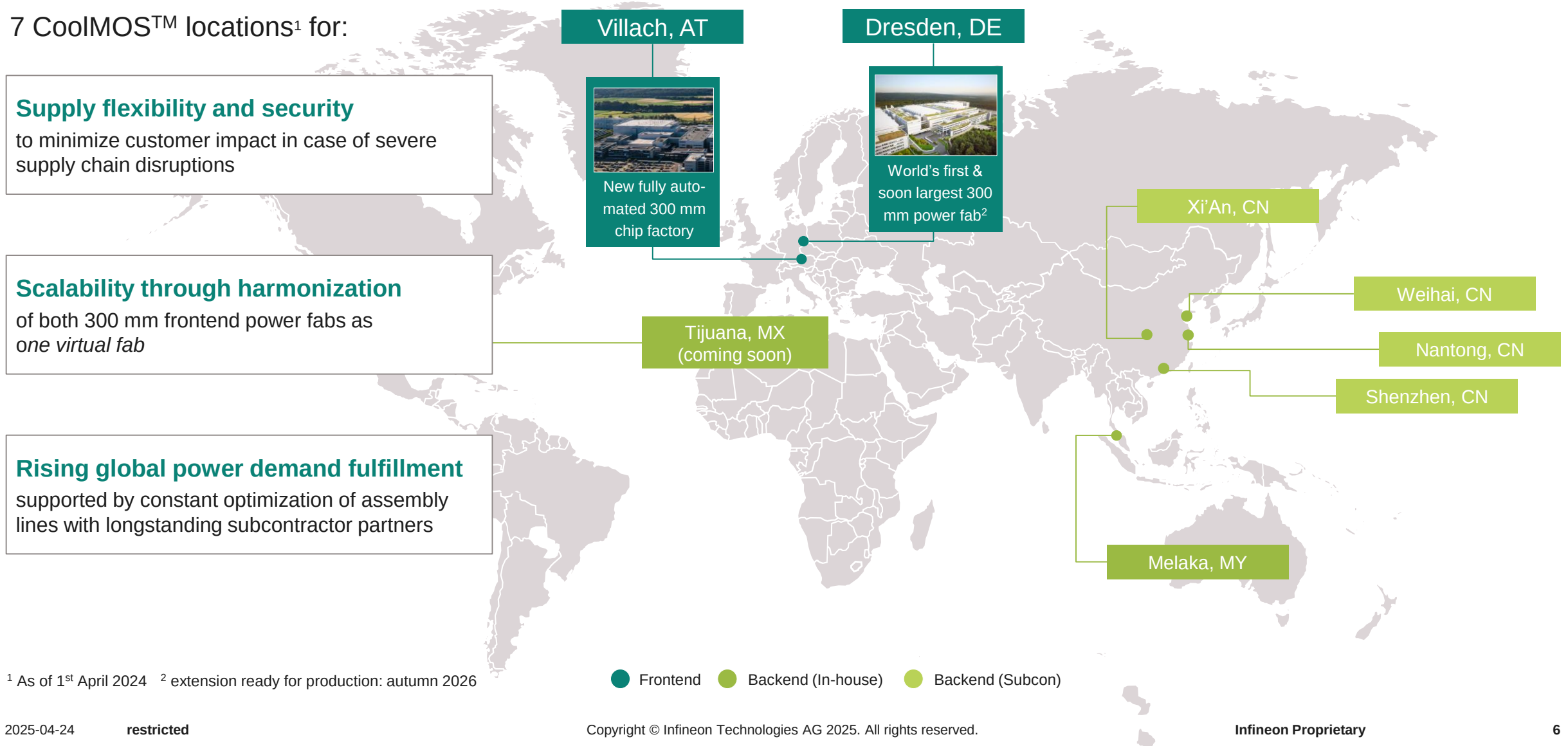
to minimize customer impact in case of severe supply chain disruptions

## Scalability through harmonization

of both 300 mm frontend power fabs as *one virtual fab*

## Rising global power demand fulfillment

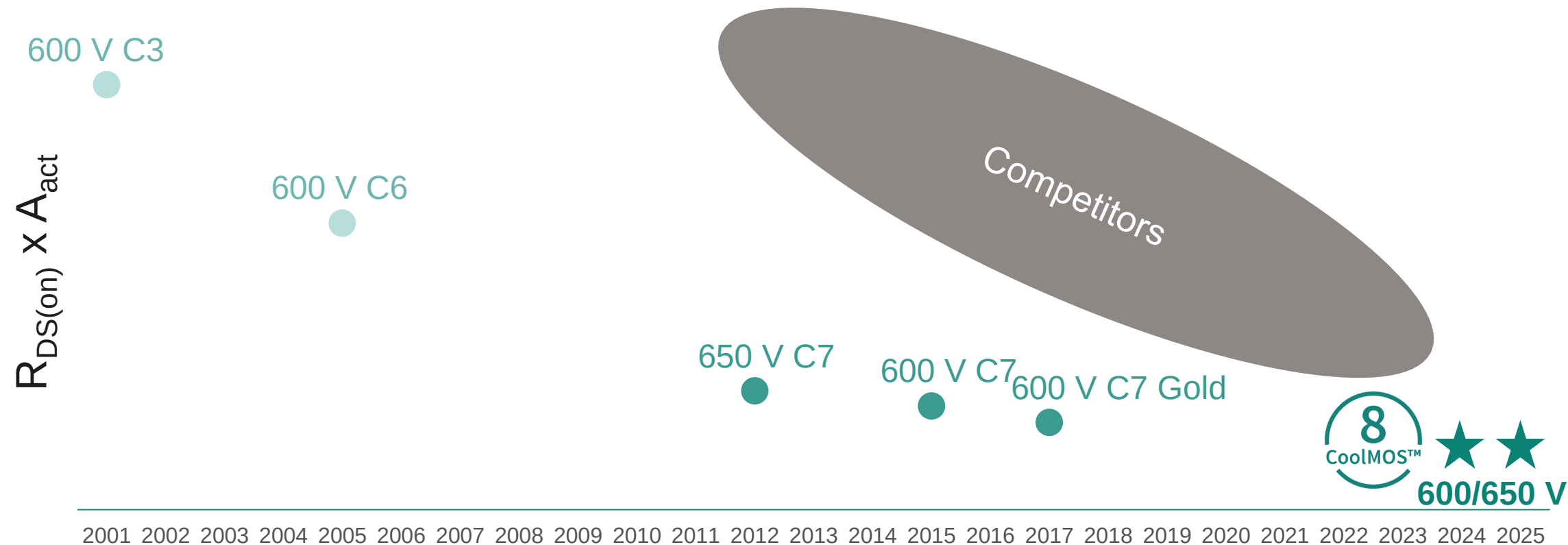
supported by constant optimization of assembly lines with longstanding subcontractor partners



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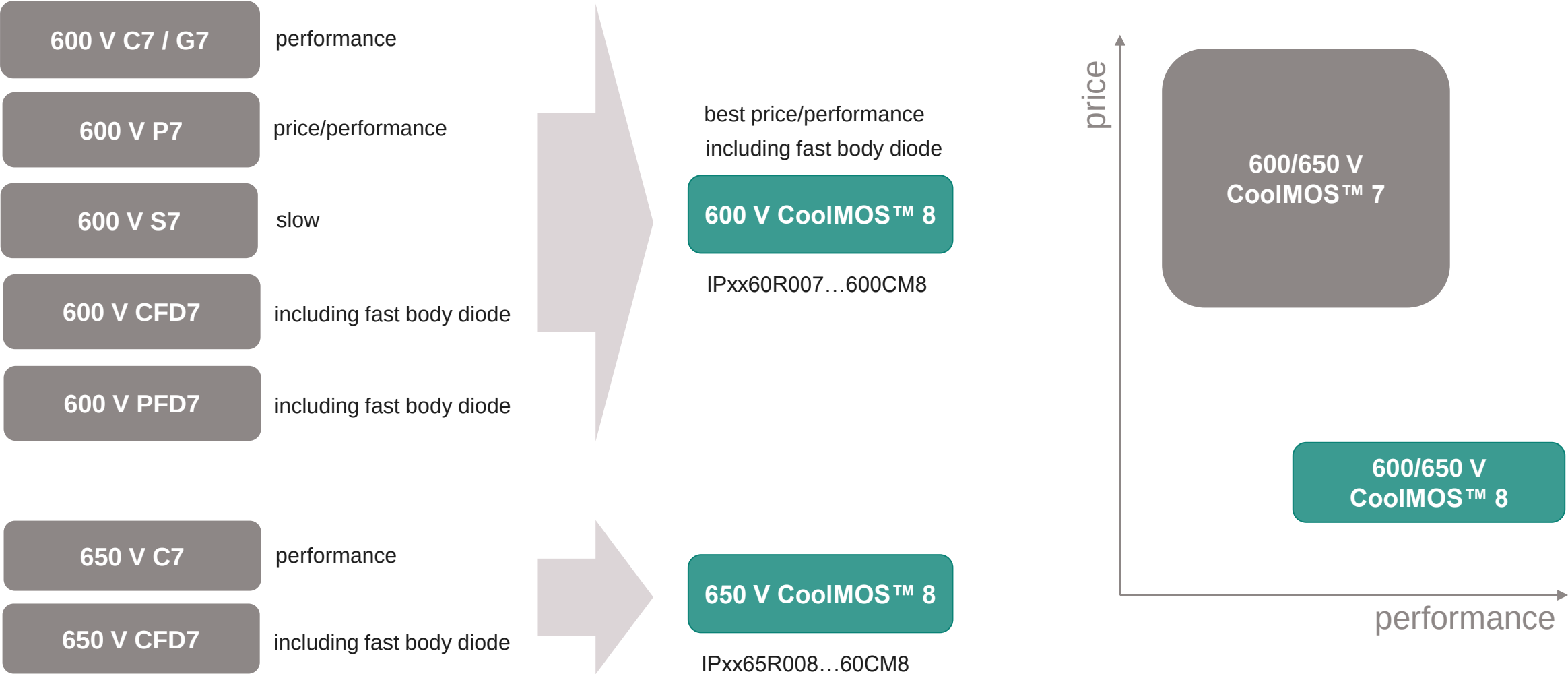
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# Infiniteon has mature, stable and well established technology leadership in SJ MOSFET globally

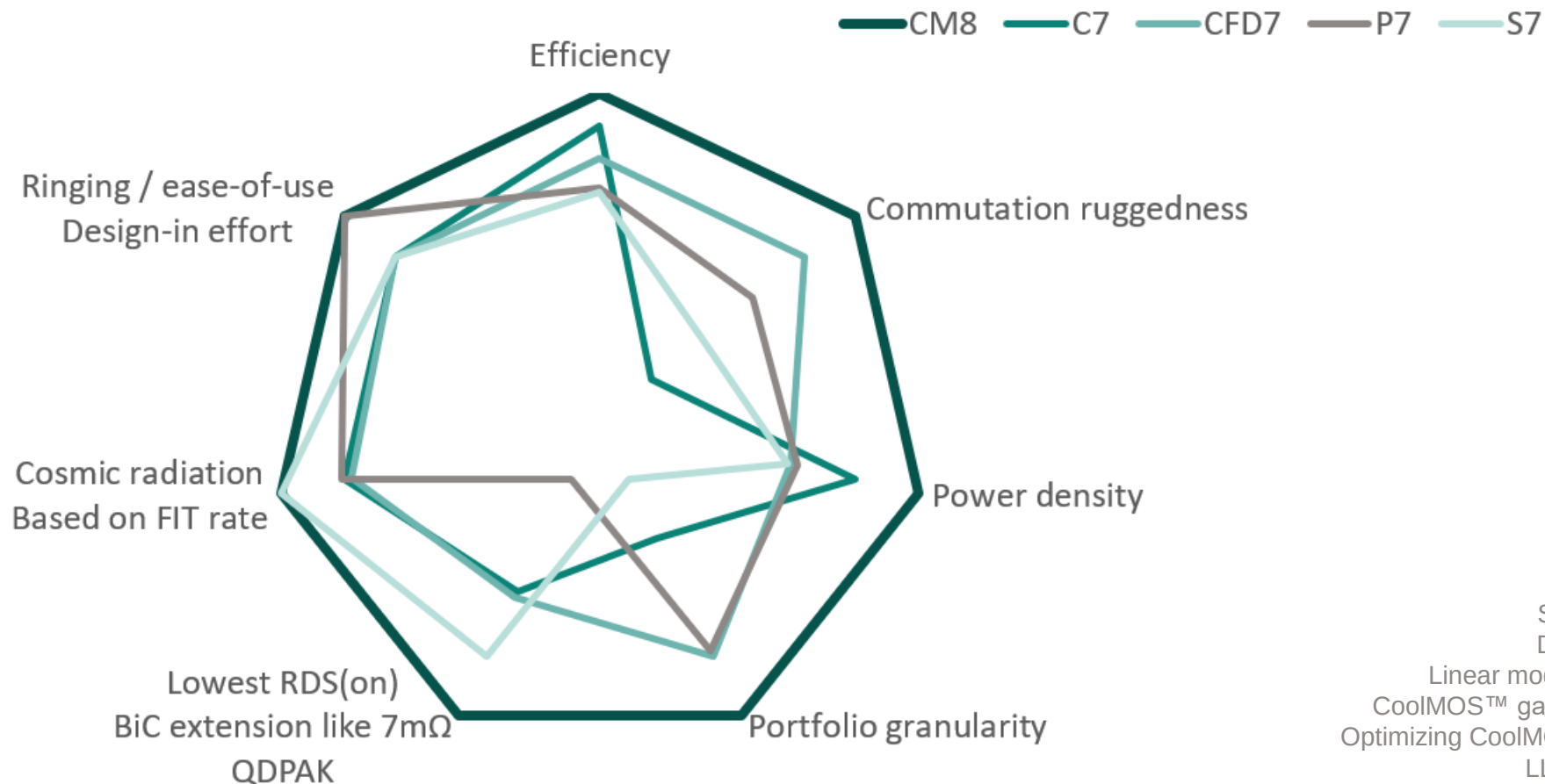




# The CoolMOS™ 8 supersedes all CoolMOS™ 7 families enhancing best price/performance alternative to WBG offering



# The 600 V CoolMOS™ 8 is fully compatible with the CoolMOS™ 7



## Design in support materials

- Some key facts about avalanche ([Link](#))
- Designing with power MOSFETs ([Link](#))
- Linear mode operation with HV MOSFETs ([Link](#))
- CoolMOS™ gate drive and switching dynamics ([Link](#))
- Optimizing CoolMOS™ to meet EMI requirements ([Link](#))
- LLC calculator (Part 1: [Link](#) Part 2: [Link](#))
- Thermal performance of SMD packages ([Link](#))
- Dynamic thermal behavior of MOSFETs ([Link](#))
- EiceDRIVER™ - Gate resistor for power devices ([Link](#))
- Meeting EMI requirements with CoolMOS™ (E2): [EN](#), [CN](#)
- Avalanche and surge for CoolMOS™ P7 family: [EN](#)

# The 600 V CoolMOS™ 8 enables highest power density at lowest possible system cost comparing WBG alternatives



| Key features                                                                        |                                                       | Benefits                                               |
|-------------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------|
|    | Best-in-class SJ MOSFET performance                   | 0.17% efficiency improvement over P7                   |
|    | Integrated fast body diode                            | Enable multiple topologies                             |
|    | Address broad hard and soft switching applications    | Ease of use and shorter design in cycle                |
|    | Simplified product portfolio                          | Easy selection and leverage economy of scale           |
|  | .XT interconnect technology                           | 14-42% lower $R_{th}$ for improved thermal performance |
|  | Gradual portfolio including BiC 7 mΩ and TSC packages | Enables system level innovation                        |

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# The CoolMOS™ 8 enables price competitive system design enhancing WBG offering



## Industrial and server SMPS cellular station and S4 (SSCB, SSR)



- Enables energy efficiency and cost targets with providing good enough power density
- SSCB enables superior protection and remote maintenance

## Micro, hybrid residential solar ESS and UPS



- Robust TSC board offering enables system size, weight and cost reduction
- Enables optimized price/performance on system level in combination with CoolSiC™

## Charging of EV DC, LEV, e-Bike, forklift and prof tools



- Best fit for cost competitive designs with good enough system level power density
- Highest quality and reliability

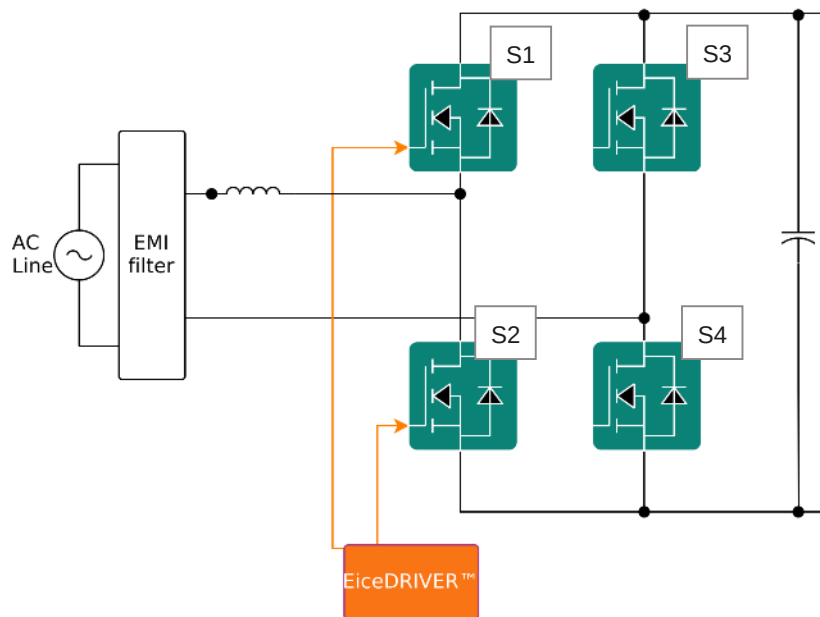
## Consumer SMPS low power drive



- Comply with ESD requirements
- Enable good enough and flexible system design
- TSC enables further assembly cost reduction



# CCM totem pole PFC



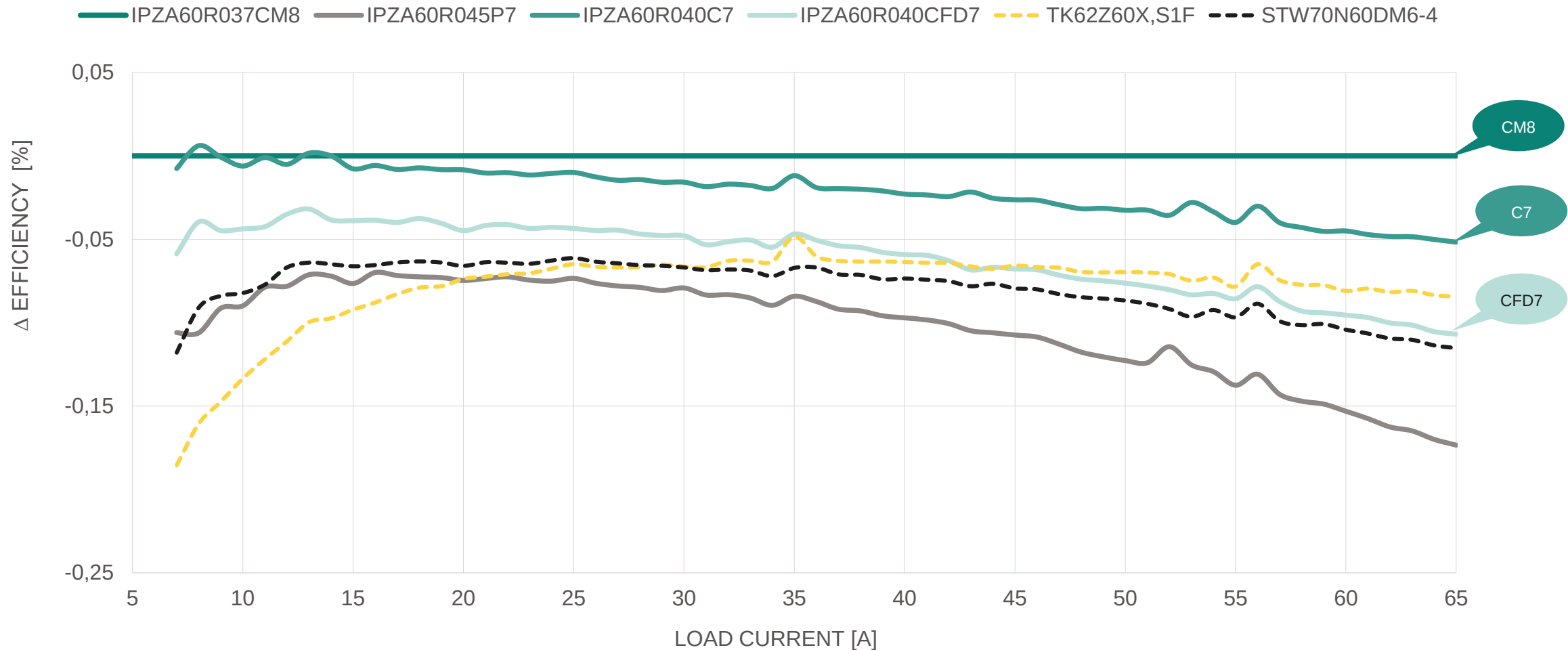
|                 |                                                                                                                  |
|-----------------|------------------------------------------------------------------------------------------------------------------|
| S1, S2          | <ul style="list-style-type: none"> <li>– CoolSiC™ MOSFET 650 V</li> <li>– CoolGaN™ HEMT 600 V / 650 V</li> </ul> |
| S3, S4          | <ul style="list-style-type: none"> <li>– <b>CoolMOS™ 8</b></li> </ul>                                            |
| Gate driver ICs | <ul style="list-style-type: none"> <li>– EiceDRIVER™ 2EDB9259Y</li> <li>– EiceDRIVER™ 2EDF9275F</li> </ul>       |

|  | Application                                                    | System power                             | Package                     | $R_{DS(on)}$ range |
|--|----------------------------------------------------------------|------------------------------------------|-----------------------------|--------------------|
|  | Server SMPS                                                    | 1 kW → 3 kW (or more with interleaving)  | TOLL, TO-247, QDPAK         | 16-180 mΩ          |
|  | Telecom SMPS                                                   | 500 W → 3 kW (or more with interleaving) | TOLL, TO-247, QDPAK         | 16-99 mΩ           |
|  | Industrial SMPS, LEV, battery formation, industrial automation | 0.8 kW → 8 kW                            | TOLL, TO-247, QDPAK, TO-220 | 7-95 mΩ            |
|  | Solar microinverters                                           | 0.8 kW → 1.6 kW                          | TOLL, QDPAK                 | 50-70 mΩ           |
|  | RAC PFC                                                        | 1 kW → 4 kW                              | TOLL, TO-247, QDPAK         | 40-99 mΩ           |

## CoolMOS™ 8 value proposition

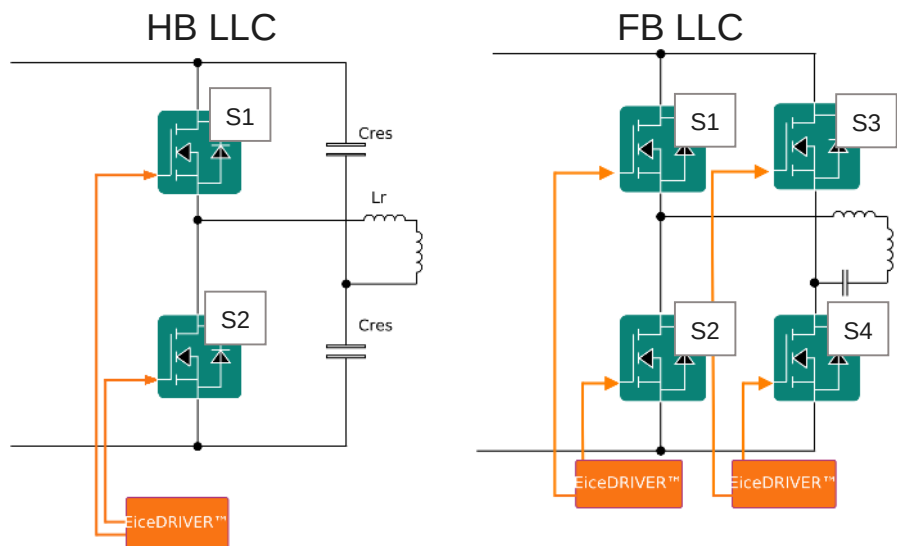
- Great PFC efficiency (>98% @ 2.7 kW load) – 0.1% improvement over C7
- Best price performance with the combination of CoolSiC™ 650 V G2 and CoolMOS™ 8
- One stop shop full totem pole solution
- Broad SMD package offering to enable assembly cost reduction

# 3.3 kW LLC board application test shows best efficiency gain with 600 V CoolMOS™ 8



CM8 has 0.05% efficiency improvement over C7 and 0.17% over P7 at high load and outperform competitor devices as well

# LLC – CoolMOS™ 8 is ideal for secondary side



S1, S2, S3, S2

- CoolSiC™ MOSFET 650 V
- CoolGaN™ HEMT 600 V / 650 V
- **CoolMOS™ 8**

Gate driver ICs

- EiceDRIVER™ 2EDR9259Y
- EiceDRIVER™ 2EDF9275F

|  | Application                                                    | System power                                         | Package                          | $R_{DS(on)}$ range |
|--|----------------------------------------------------------------|------------------------------------------------------|----------------------------------|--------------------|
|  | Server SMPS                                                    | 1 kW → 3 kW (or more with interleaving)              | TOLL, TO-247, QDPAK              | 40-70 mΩ           |
|  | Telecom SMPS                                                   | 500 W → 3 kW (or more with interleaving)             | TOLL, TOLL, QDPAK                | 20-70 mΩ           |
|  | EV charging                                                    | 7 kW → 50 kW (stacked / multilevel and interleaving) | TO-247, QDPAK, TOLL              | 7-37 mΩ            |
|  | Industrial SMPS, LEV, battery formation, industrial automation | 0.8 kW → 8 kW                                        | TOLL, TOLT, TO-247, TO220, QDPAK | 7-95 mΩ            |

## CoolMOS™ 8 value proposition

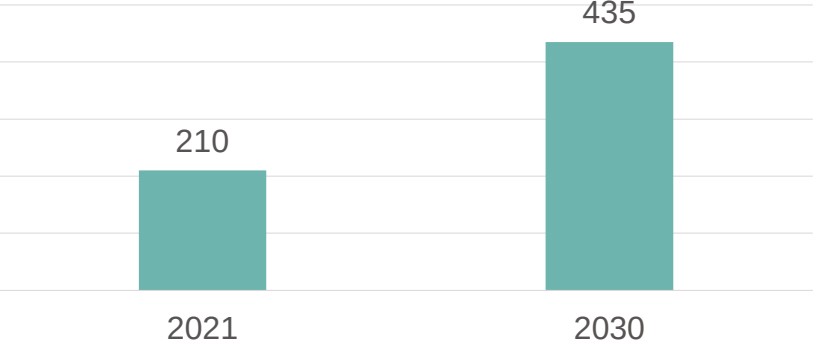
- Best price performance with CoolMOS™ 8
- One stop shop full
- Broad SMD package offering to enable assembly cost reduction

# Storing solar energy

## Enhance the system value with CoolMOS™ 8 on secondary side



Global market size  
in billion USD CAGR 8.4%



Source: Arrow Electronica 2022

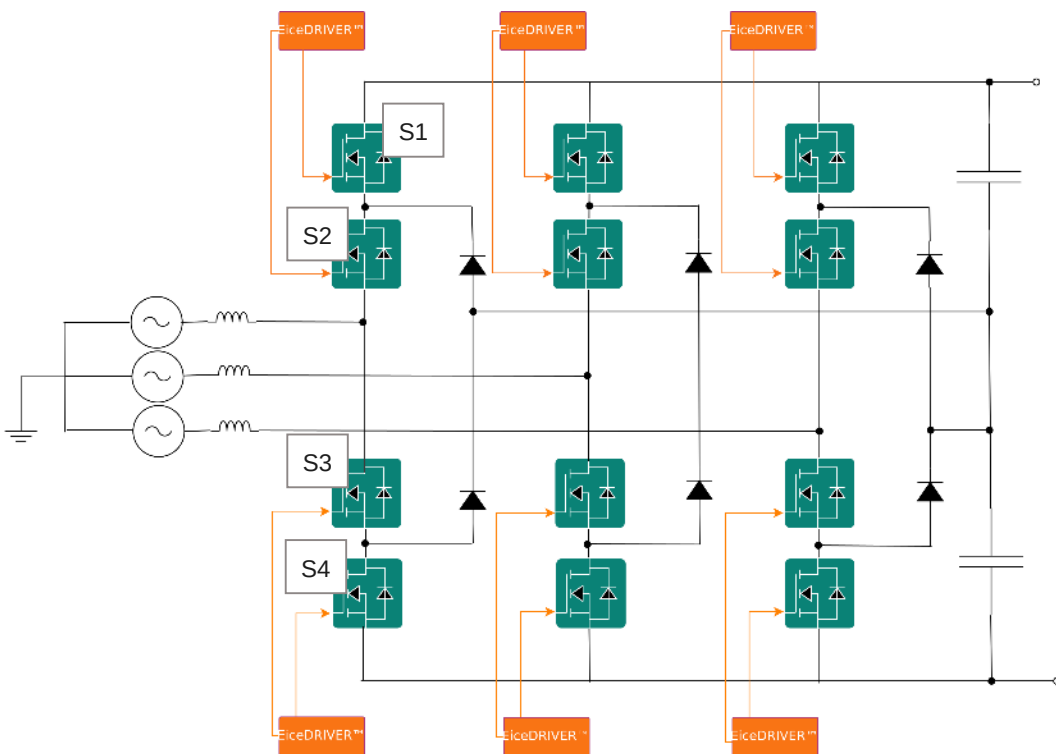
### Battery growth factors

- Renewable energy infrastructure
- EV infrastructure
- V2x
- Efficient Grid Management
- Regular Load management
- Efficient & uninterrupter power supply

### Topology options where both CoolSiC™ and CoolMOS™ 8 can be used

| DC-DC<br>400 V/800 V DC link | DC-AC 1-phase<br>400 V DC link | DC-AC 3-phase<br>400 V/800 V DC link |
|------------------------------|--------------------------------|--------------------------------------|
| ZVS phase shift full bridge  | Bi-directional TNPC            | Bi-directional TNPC                  |
| Dual active bridge (DAB)     | ANPC                           | ANPC                                 |
| CLLC Converter               | H-bridge inverter              |                                      |

## 3-level NPC for bidirectional use



|                 |                                                    |
|-----------------|----------------------------------------------------|
| S2, S3          | – CoolSiC™ MOSFET 650 V                            |
| S1, S4          | – <b>CoolMOS™ 8</b>                                |
| Gate driver ICs | – EiceDRIVER™ 2EDB9259Y<br>– EiceDRIVER™ 2EDF9275F |

|  | Application                                                   | System power | Package             | $R_{DS(on)}$ range |
|--|---------------------------------------------------------------|--------------|---------------------|--------------------|
|  | EV charging including LEV, microEV, folklift, wireless, eBike | Up to 22 kW  | TO-247, QDPAK, TOLL | 7-180 mΩ           |
|  | Residential solar and ESS                                     | Up to 7 kW   | TO-247, QDPAK TOLL  | 16-180 mΩ          |

### CoolMOS™ 8 value proposition

- Best possible system level power density with Si solution on the market today
- Available in TSC SMD to enable assembly cost reduction
- 5Celsius cooler PFC choke at high load

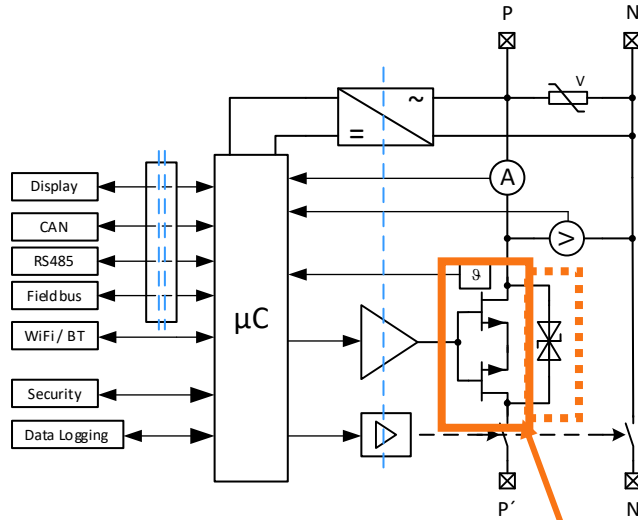


# The 600 V CoolMOS™ 8 is superior in SSCB applications as it fixes the high current switch-off challenge with S7



## Principle schematic

Back-to-back switch as key building block



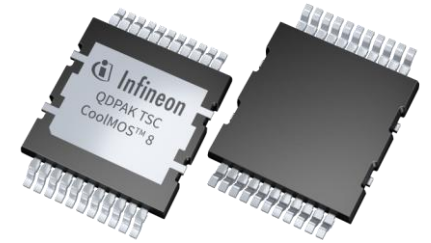
Clamping & protection solution  
w/ companion devices

**Power switch**  
(CoolMOS™ 8, CoolSiC™)

Power  
Stage

## Primary target segments

- Servers (SSCB)
- EV charging infrastructure (SSCB)
- Battery energy storage system (SSCB)
- Industrial automation (motor starter)
- Smart building (SSCB)



## Key features

- Best-in-class SJ  $R_{DS(on)}$  7mΩ with the latest CoolMOS™ 8 technology
- Ideal for paralleling to achieve even lower  $R_{DS(on)}$
- Proven high current pulse robustness
- Robust TCoB 2000 cycles
- 260C° soldering peak point
- SMT compatible up to 3 reflow cycles
- Top-side cooling package enables direct mounting of thermal mass to transistor heatslug



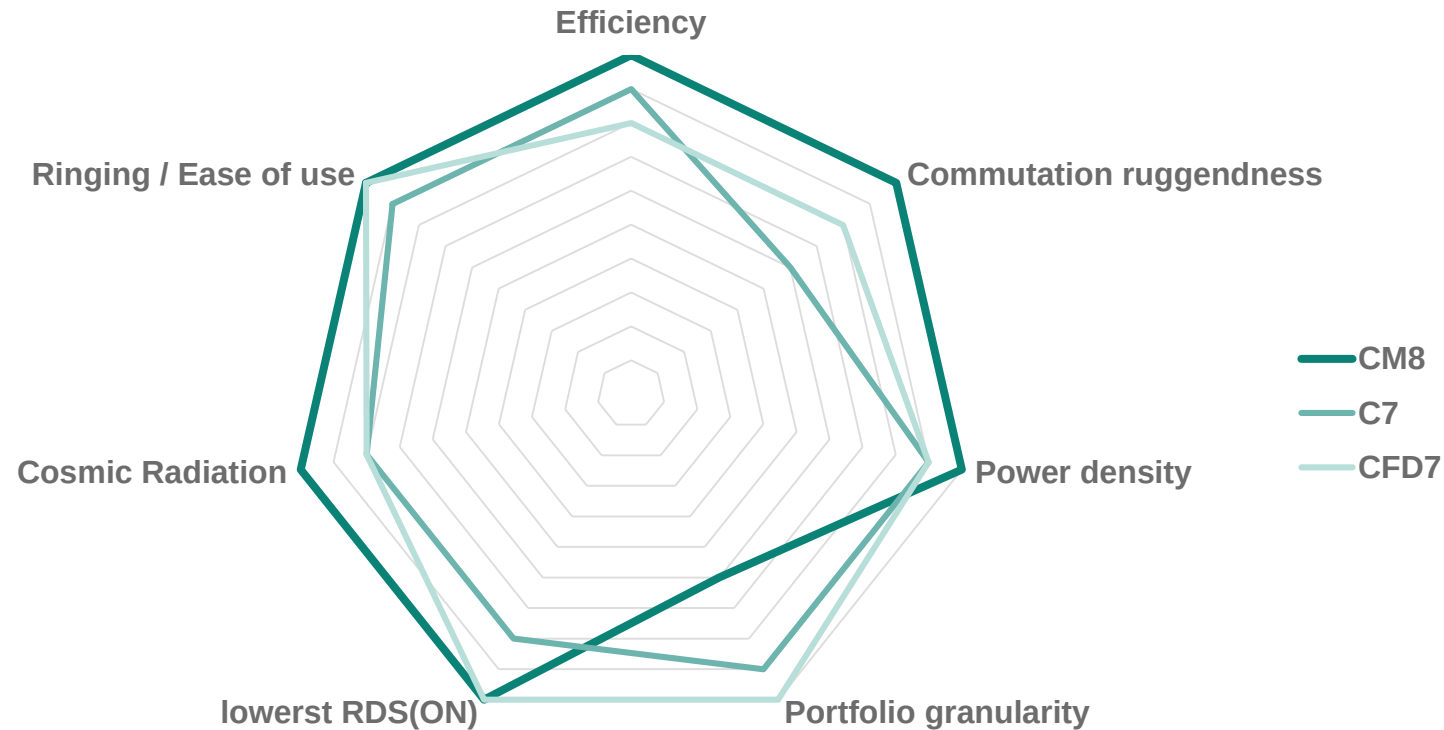
[Download application note](#)



# 650 V CoolMOS™ 8



# The new 650 V CoolMOS™ 8 is fully compatible with the CoolMOS™ 7 family



## Design in support materials

- Some key facts about avalanche ([Link](#))
- Designing with power MOSFETs ([Link](#))
- Linear mode operation with HV MOSFETs ([Link](#))
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# 650 V CoolMOS™ 8 providing 50 V additional buffer



Best silicon  $R_{DS(ON)}$ \*A technology



Address broad hard and soft switching applications

Provide 50 V additional buffer to:



fulfill requirement of increased AC-line input to 277 V<sub>AC</sub> for data center & telecom



support EV charging designers in less experienced parts of the world



additional surge protection in S4 application



650 V



BiC product as single die is as low as 8 mΩ



.XT interconnect technology



Integrated fast body diode



Ease-of-replacement, better efficiency and cost down

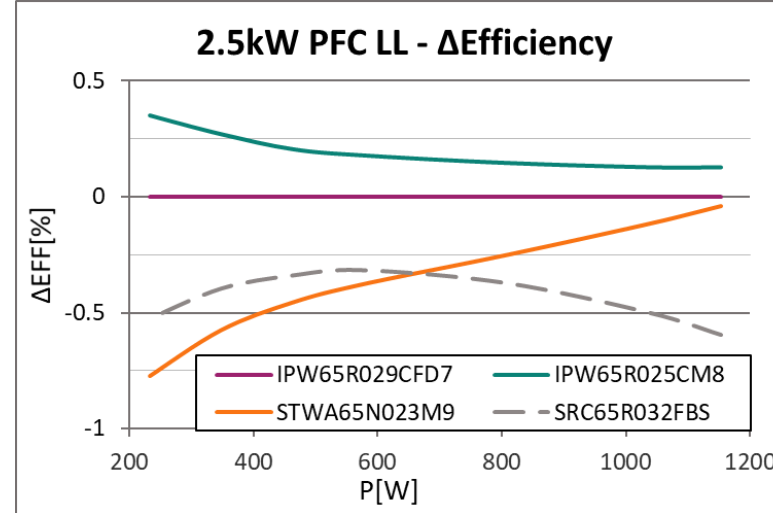
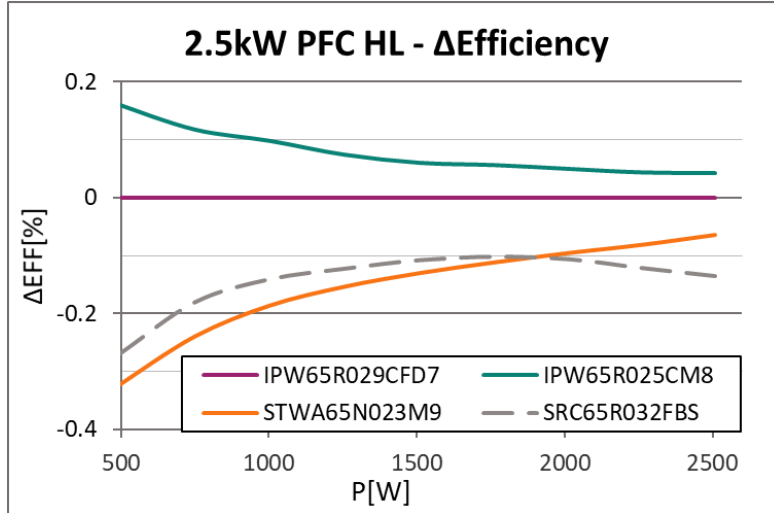


Alternative offer to WBG solutions with low design-in effort



Minimized cost of maintenance due extra breakdown voltage margin for derating purposes (according to IPC 9592 de-rating guidelines)

# 650 V CoolMOS™ 8 PFC and LLC Efficiency testing of 25 mΩ TO247-3 devices:



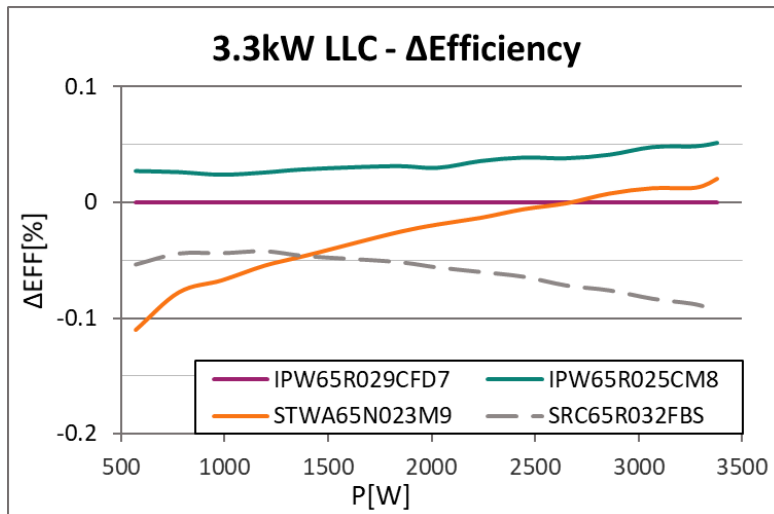
## PFC conditions:

$$R_{G,sum} = 8 \Omega$$

$$f_{sw} = 110 \text{ kHz}$$

## LLC conditions:

Each part has been optimized to achieve best efficiency



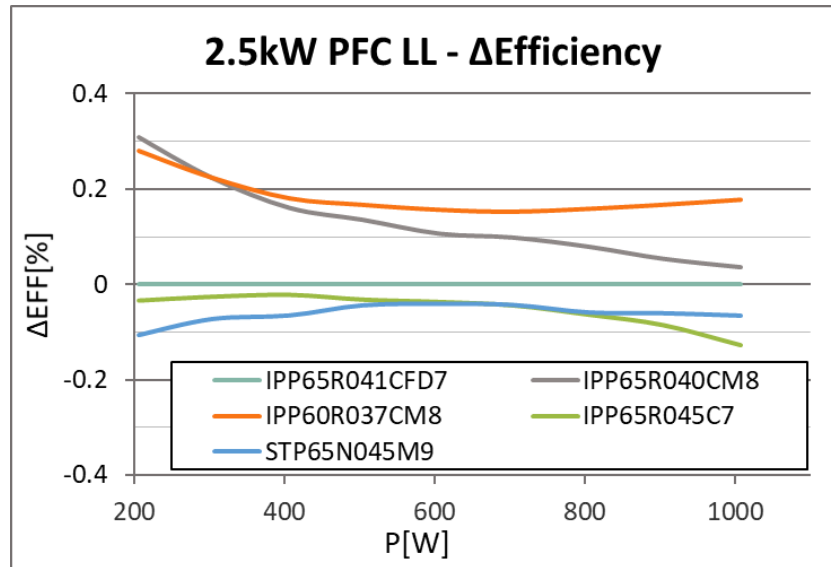
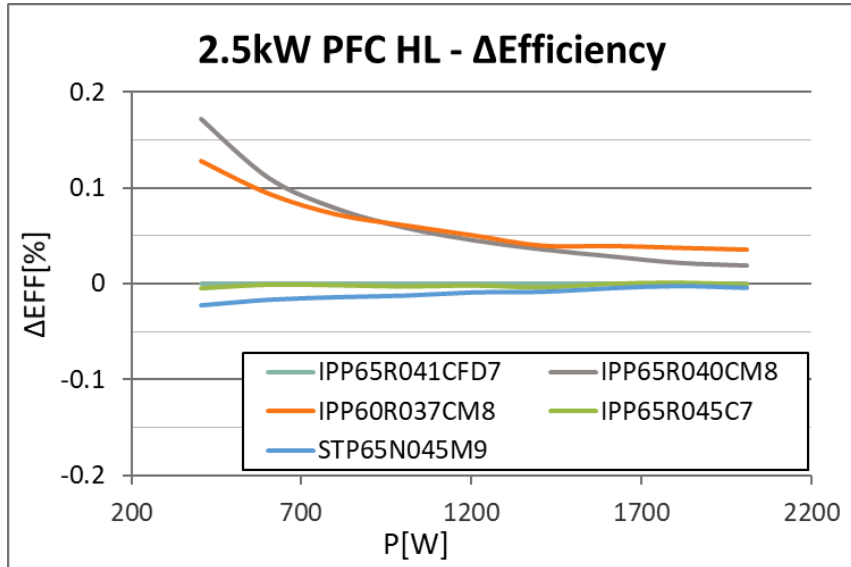
## PFC Measurement (Hard switching)

- CM8 650 V shows especially in light load up to 0.15% better efficiency in high line, 0.4% in low line compared to 650 V CFD7
- All measured competitor parts show especially in low line up to 0.7% worse efficiency compared to CFD7

## LLC Measurement (Soft switching)

- All measured parts show a similar performance
- CM8 tend to have a better performance over the full load range

# 650 V CoolMOS™ 8 PFC and LLC Efficiency testing of 40 mΩ devices



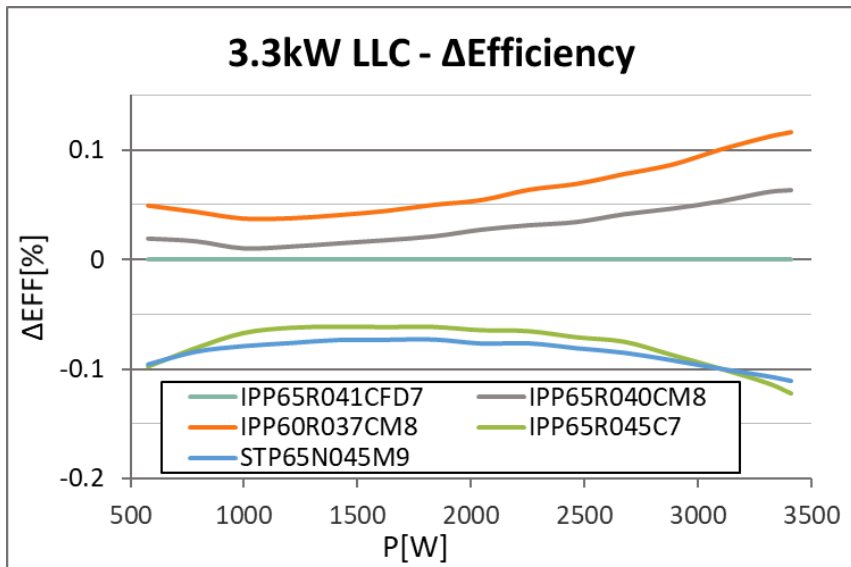
**PFC conditions:**

$$R_{G,sum} = 5 \Omega$$

$$f_{sw} = 130 \text{ kHz}$$

**LLC conditions:**

Each part has been optimized to achieve best efficiency



## 2.5 kW PFC (Hard switching)

- **CM8 shows** especially in light load up to 0.15% **better efficiency** in high line, 0.3% in low line. 650V CM8 and 600V CM8 have a similar performance in high line as well as low line. Full load performance difference between 600 V and 650 V mainly coming from conduction losses driven by  $R_{DS(ON)}$
- C7, CFD7 and STM M9 have an equal performance in low and high lines.

## 3.3 kW LLC (Soft switching)

- The LLC measurements show a similar performance of 600V CM8 and 650V CM8.
- Both **CM8 parts show an efficiency improvement** over CM7 and STM M9



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# The 600 V and 650 V CoolMOS™ 8 product portfolio

| V <sub>br</sub> | R <sub>DS(on),max</sub><br>[mΩ] | SMD Packages  |               |                                                |                               |                                                                          | THD Packages     |                  |                  |                              | Applications      |
|-----------------|---------------------------------|---------------|---------------|------------------------------------------------|-------------------------------|--------------------------------------------------------------------------|------------------|------------------|------------------|------------------------------|-------------------|
|                 |                                 | QDPAK<br>     | DDPAK<br>     | TOLL<br>leadless<br>                           | Thin-TOLL<br>8x8 leadless<br> | DPAK<br>                                                                 | TO-247 3-pin<br> | TO-247 4-pin<br> | TO-220 3-pin<br> | TO-220 FP<br>Narrow Lead<br> |                   |
| 600 V           | 600                             |               |               |                                                |                               | IPD60R600CM8                                                             |                  |                  |                  |                              | Server            |
|                 | 360                             |               |               |                                                |                               |                                                                          |                  |                  |                  |                              |                   |
|                 | 280                             |               |               |                                                |                               |                                                                          |                  |                  |                  |                              | Telecom           |
|                 | 180                             |               | IPDD60R180CM8 | IPT60R180CM8                                   | IPTA60R180CM8                 | IPD60R180CM8                                                             |                  |                  | IPP60R180CM8     | IPAN60R180CM8                |                   |
|                 | 160                             |               |               | IPT60R160CM8                                   |                               |                                                                          |                  |                  |                  |                              | SMPS              |
|                 | 120                             |               |               | IPT60R120CM8                                   |                               |                                                                          | IPW60R120CM8     |                  |                  |                              |                   |
|                 | 99                              |               |               | IPT60R099CM8                                   |                               |                                                                          | IPW60R099CM8     | IPZA60R099CM8    |                  |                              | Solar & ESS       |
|                 | 70                              | IPDQ60R070CM8 |               | IPT60R070CM8                                   |                               |                                                                          | IPW60R070CM8     | IPZA60R070CM8    |                  |                              |                   |
|                 | 55                              | IPDQ60R055CM8 |               | IPT60R055CM8                                   |                               |                                                                          | IPW60R055CM8     | IPZA60R055CM8    |                  |                              | EV charging       |
|                 | 37                              | IPDQ60R037CM8 | IPDD60R037CM8 | IPT60R037CM8                                   |                               |                                                                          | IPW60R037CM8     | IPZA60R037CM8    | IPP60R037CM8     |                              |                   |
|                 | 24                              | IPDQ60R024CM8 |               | IPT60R024CM8                                   |                               |                                                                          | IPW60R024CM8     | IPZA60R024CM8    |                  |                              | SSCB              |
|                 | 16                              | IPDQ60R016CM8 |               | IPT60R016CM8                                   |                               |                                                                          | IPW60R016CM8     | IPZA60R016CM8    | IPP60R016CM8     |                              |                   |
|                 | 7                               | IPDQ60R007CM8 |               |                                                |                               |                                                                          |                  |                  |                  |                              | UPS               |
|                 | 4                               |               |               |                                                |                               |                                                                          |                  |                  |                  |                              |                   |
| 650 V           | 60                              |               |               |                                                |                               |                                                                          | IPW65R060CM8     |                  |                  |                              | Fridge compressor |
|                 | 40                              |               |               | IPT65R040CM8                                   |                               |                                                                          | IPW65R040CM8     | IPZA65R040CM8    |                  |                              |                   |
|                 | 25                              |               |               | IPT65R025CM8                                   |                               |                                                                          | IPW65R025CM8     | IPZA65R025CM8    |                  |                              |                   |
|                 | 18                              | IPDQ65R018CM8 |               | IPT65R018CM8                                   |                               |                                                                          | IPW65R018CM8     | IPZA65R018CM8    |                  |                              |                   |
|                 | 8                               | IPDQ65R008CM8 |               |                                                |                               |                                                                          |                  |                  |                  |                              |                   |
| Released        |                                 |               |               | STD Samples: Available<br>Launched in April 25 |                               | Portfolio extension<br>STD samples: from end of Apr 25<br>Launch: May 25 |                  |                  |                  |                              |                   |

# Gate driver ICs portfolio overview to drive CoolMOS™ 8

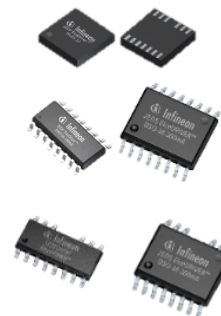
Galvanically isolated

## 1EDB



- Low MOSFET switching losses
- 5 A/9 A separated output source/sink current
- 4 V, 8 V, 12 V, 15 V UVLO options
- Shoot-through protection during boot-strapped half-bridge start-up
- **300 V/ns CMTI**
- DSO-8 NB
- **Single protection, UL1577 certificate**

## 2EDi



- **Safety feature STP/DTC options** EN/DIS options
- 5 A/9 A output source/sink current
- 4 V, 8 V, 12 V, 15 V UVLO options
- 2  $\mu$ s fast UVLO startup time
- 20 ns fast Active output clamp
- 150 V/ns CMTI
- DSO-14 NB/WB, DSO-16 NB/WB, LGA5\*5, LGA4\*4
- **Basic or reinforced isolation**
- VDE-0884-11, UL1577, and EN62368-1 certificates

Non-isolated

## 1EDN-TDI



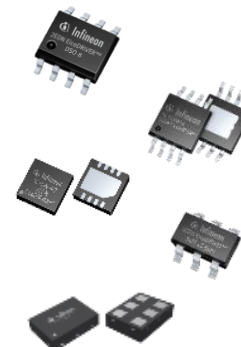
- Truly differential inputs (TDI)
- 4 A/8 A separated output source/sink current
- 4 V, 8 V, 12 V, 15 V UVLO options
- SOT23-6, TSNP-6

## 1EDN



- **Differential input pins** (non-inverting and inverting)
- 4 A/8 A separated output source/sink current
- 4 V, 8 V UVLO options
- SOT23-5, SOT23-6, TSNP-6

## 2EDN



- **Improved features and smallest form factor**
- 4 A or 5 A output current variants
- 4 V, 8 V UVLO options
- 2  $\mu$ s fast UVLO startup time
- 20 ns fast active output clamp
- DSO-8, WSON-8, TSSOP-8, SOT23-6, TSNP-6 (**world smallest 2-channel driver**)

1-channel driver ICs

2-channel driver ICs

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# Infiniteon provides the highest quality and reliability with CoolMOS™ technologies



## Stable, mature production

100% fulfillment of committed stability parameter in development, frontend, backend

## Multisite front end fabs

Provide supply chain security

## Global quality management

Strong regional customer support

> 6.7 billion parts shipped in last 7 years

5 field fails caused by Infiniteon

# 0.007 DPM



We do what we promise. That's quality made by Infiniteon

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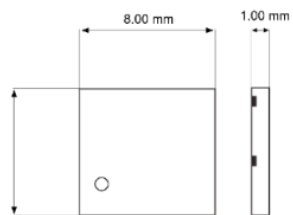
|   |                                                                                  |           |
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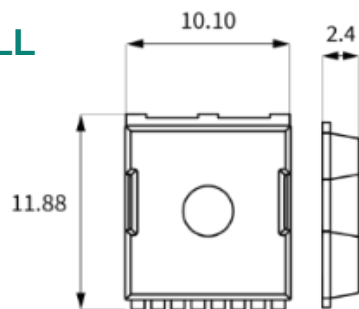
# 600 V Thin-TOLL 8x8 has 5x more TCoB over Thin-PAK 8x8

First IPTA60R180CM8 will be released in 2024 and portfolio extension is planned up to 37 mohm until 2026

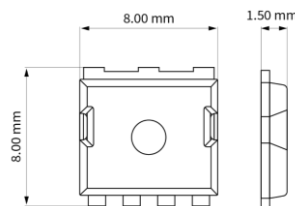
## Thin-PAK 8x8



## TOLL



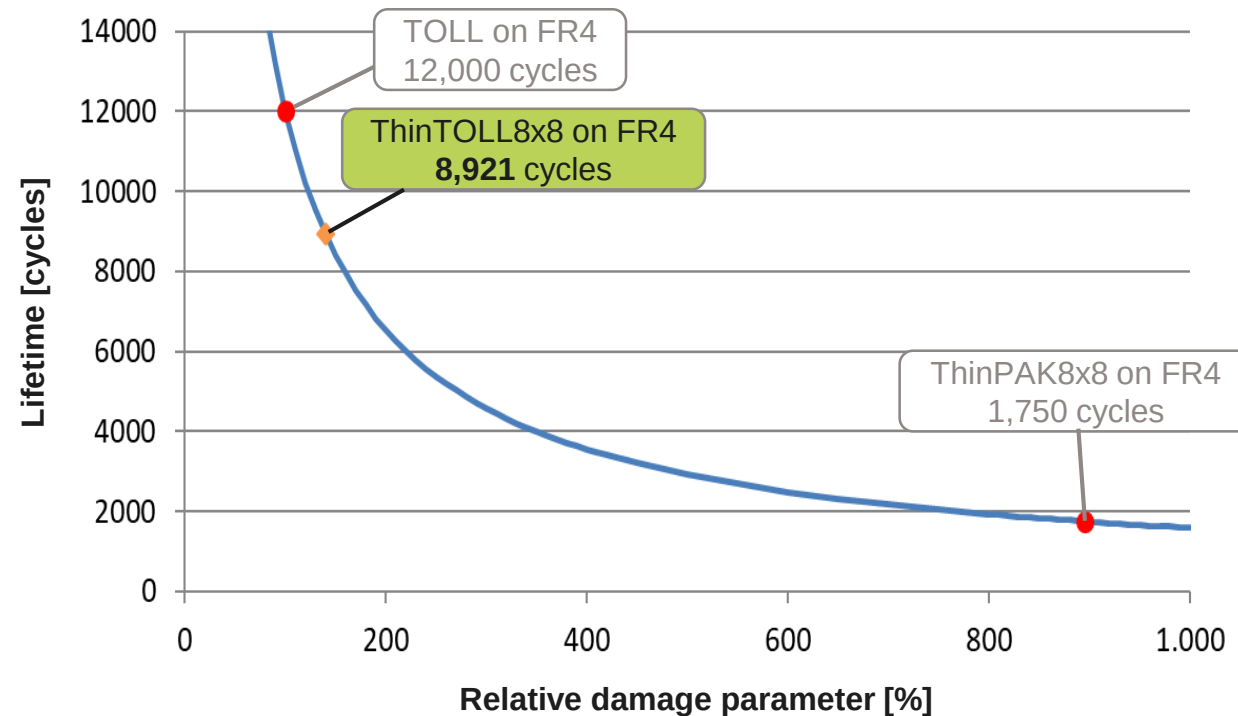
## Thin-TOLL 8x8



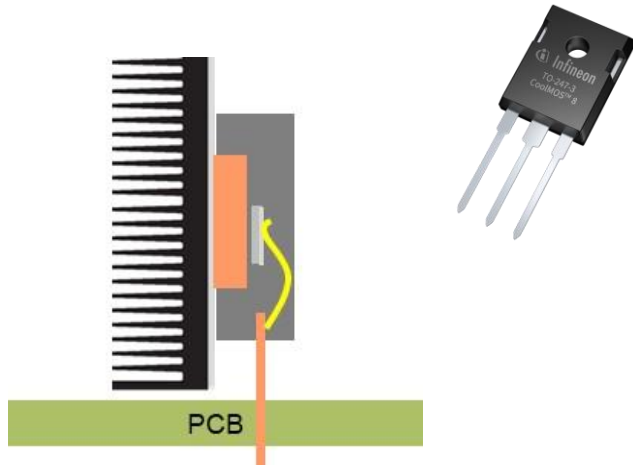
## Thin-TOLL 8x8 benefits

- Small footprint enables high power density
- Fully leveraging the .XT technology to improve thermal performance
- 8x8 footprint
- 5x more TCoB capability over Thin-PAK

## TCoB comparison between Thin-PAK, Thin-TOLL and TOLL

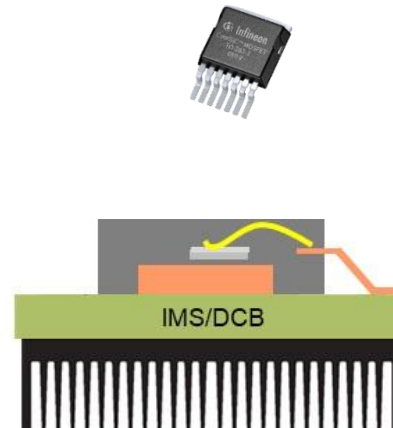


# Package evolution which enables high volume assembly and PCB design improvement at expensive assembly location



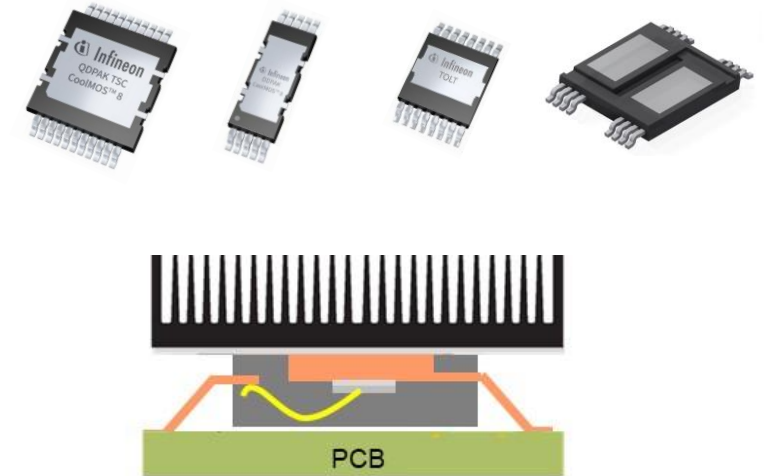
THD – Through hole device

- Robust thermal performance
- Mature design
- Idea for low volume production
- Expensive manual assembly
- Large application design
- Low pin count, improved with 4-pin variant



SMD bottom-side cooling

- Medium thermal performance
- Mature package design
- Fully automatic handling
- High pin count
- IMS is required for BSC
- Limited portfolio due to package size
- One side of PCB used



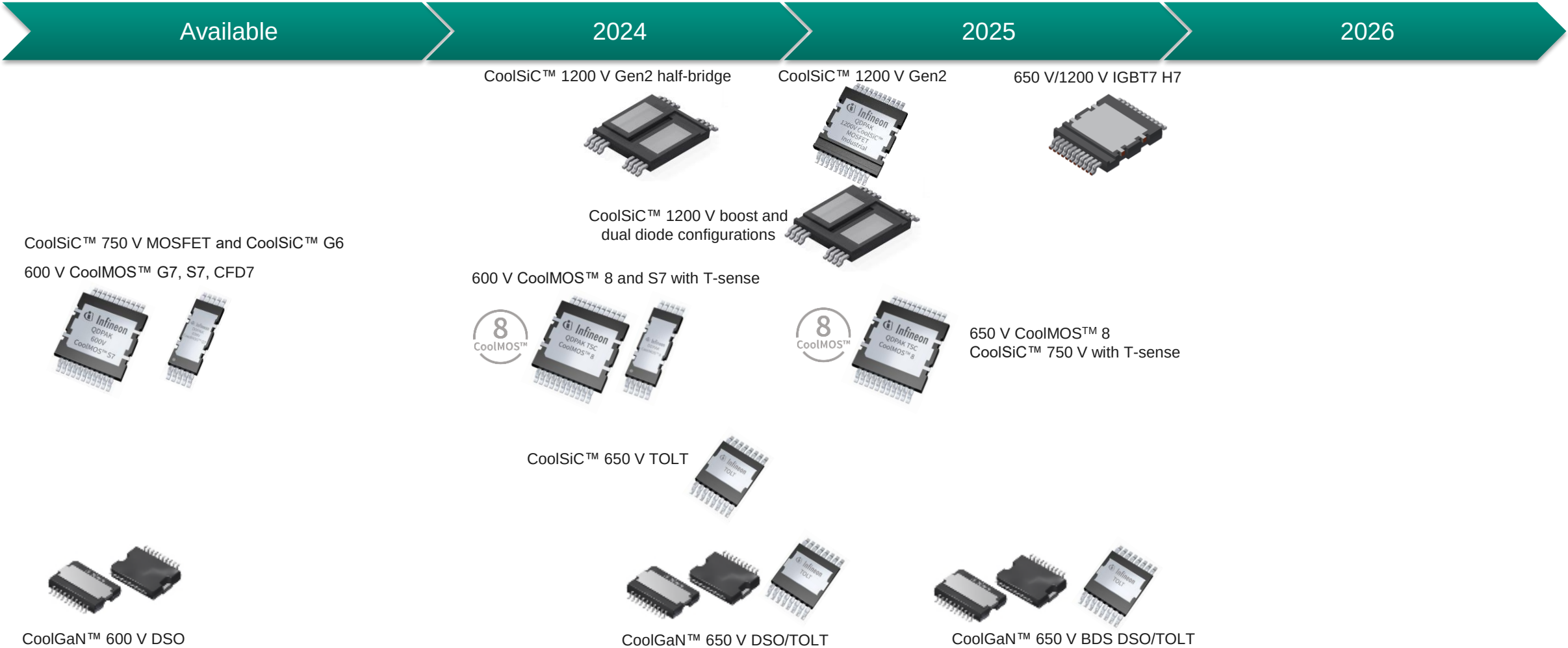
SMD top-side cooling

- Optimal thermal performance
- Lowest possible assembly cost
- High pin count results lowest parasitics
- Both side of PCB can be used
- Broad portfolio available
- New industrial standard
- Redesign required

# Infiniteon industrialises top-side cooling product category with robust release strategy

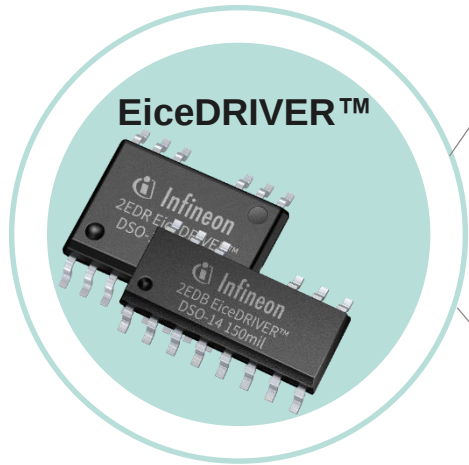


Package IP is available through standardization of QDPAK package in JEDEC



Wide range of products with standard 2.3 mm packaging height

# QDPAK TSC + EiceDRIVER™ delivers optimized cost and performance for system designs



2EDRx25xXQ1

2EDRx25xXTQ1

2EDBx259YQ1

SoP date

Q1 2024

Q4 2024

Q2 2024



Unipolar gate-driving compatibility, delivers optimal  $R_{DS(on)}$  performance on the switches

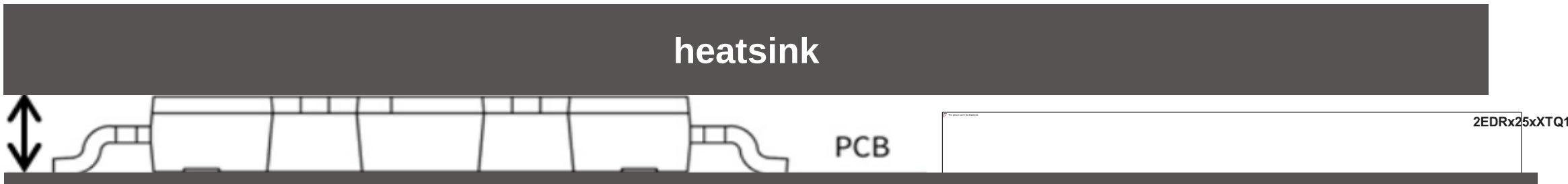


Package CTI\* >600 V from **EiceDRIVER™** eases system certification and compliance



Narrow height of gate driver makes it a perfect companion to QDPAK TSC, even under the heatsink

2.35 mm



# We believe in the value of our package concept and enable the market to join us and enable multi-sourcing of critical components



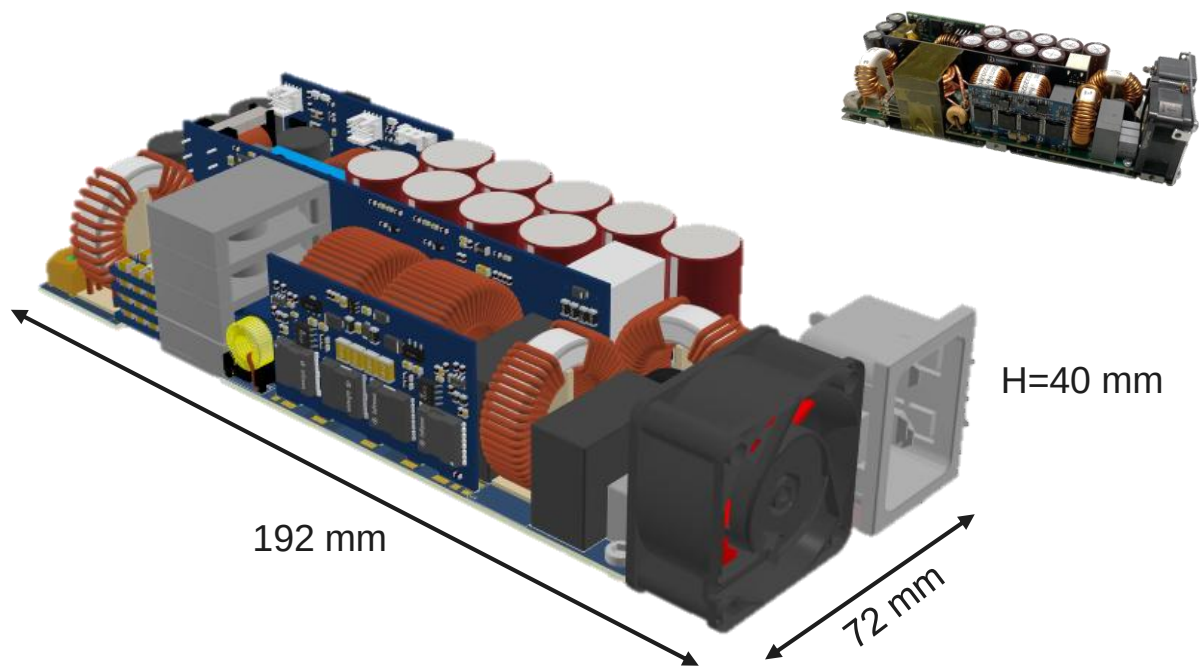
- Infineon has enabled the market to follow through with the QDPAK package concept
- Infineon sees interest from other players in the market regarding QDPAK adoption
- Strong advantages of the QDPAK package portfolio are too significant to be ignored
- Infineon believes in the long-term success of this package portfolio in the market

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# Reference design REF\_3K3W\_HFHD\_PSU for 600 V

## 3.3 kW high frequency and high power density (HF/HD) rectifier



### Features

- **Benchmark 97,5% of efficiency @ 95W/in<sup>3</sup>** including all /1U formfactor
- Highest efficiency & power density with CoolMOS™ 8, CoolSiC™, CoolGaN™
- Novel integrated planar magnetic construction
- Full digital control (PFC and DCDC)
- Totem pole PFC + half-bridge GaN LLC

### Technical details

| PFC key requirements      | Value                                                                           |
|---------------------------|---------------------------------------------------------------------------------|
| Input voltage range       | 180 V <sub>AC</sub> ~ 275 V <sub>AC</sub>                                       |
| Output voltage range      | 51 - 48 V <sub>DC</sub>                                                         |
| Output current nom        | @51 V=65 A @50 V=66 A @48 V=69 A                                                |
| Output power max          | 3300 W                                                                          |
| Efficiency                | ~ 97,5 %                                                                        |
| Power factor (load > 10%) | PF > 0.95 @ 180 ~ 275 V <sub>AC</sub><br>iTHD < 10% @ 180 ~ 275 V <sub>AC</sub> |
| Temperature ambient       | 0°C to 50°C                                                                     |
| Fsw. LLC                  | 550 kHz                                                                         |

### Learn more

|                     |                                                                                                                                                                                                         |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Infineon components | 4xIGT60R042D1, 4xIMT65R057M1H, 5xIPT60R016CM8, 1xIPT60R080G7, 1xIDL10G65C5, 1EDB8275F, 1EDN8511B, 2EDB9259Y, 1EDN8550B, IQE046N08LM5, ICE2QR2280G, BAT46WJ, BAT165, BSS138N, TLS4120D0EPV33, 4DIR1400H, |
| Controller          | XMC4200 PFC, microchip for high frequency control LLC                                                                                                                                                   |
| Application         | Industrial SMPS, telecom rectifier, battery charging                                                                                                                                                    |

### Benefits

- Full Infineon's semiconductor solution
- Complete power supply unit (PSU) including PFC + DCDC
- High efficiency, proprietary and integrated magnetics design
- Hold up time extension circuit

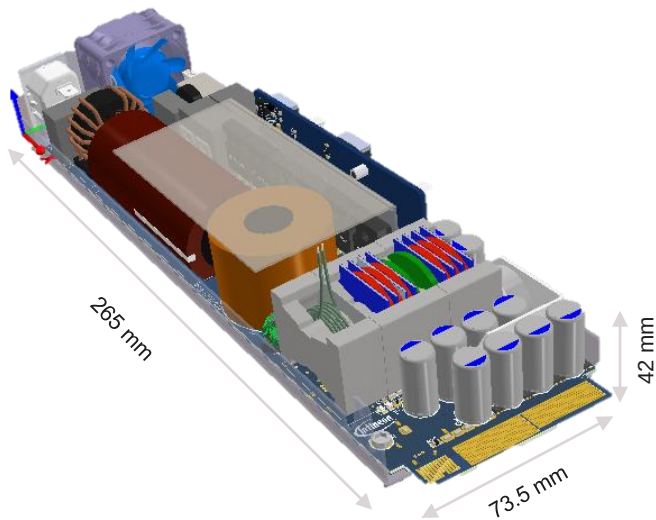


# 2.7 kW 80 plus titanium enterprise server SMPS with digital control

## EVAL\_2K7W\_12V\_PSU for 600 V



Titanium 



### Features

- High efficiency bridgeless totem pole PFC + LLC converter for DC/DC stage
- High power density
- Enabled by CoolSiC™ 650 V + 600 V CoolMOS™ 8
- Digitally controlled with XMC1404 (PFC) and XMC4200 (LLC)
- Exploring variable PFC switching frequency to reduce inductor size and/or losses

### Technical details

| Key requirements          | Value                                         |
|---------------------------|-----------------------------------------------|
| Input voltage range       | 180 V <sub>AC</sub> ~ 275 V <sub>AC</sub>     |
| Output voltage            | 12 V <sub>dc</sub>                            |
| Output current            | 224 A                                         |
| Output power              | 2700 W                                        |
| Peak efficiency           | > 96%                                         |
| Dimension & power density | 265 mm X 73.5 mm X 42 mm, 3300 W/L, 54.1 W/in |
| Power factor (load > 20%) | 0.9                                           |
| Hold up time at full load | 10 ms                                         |

### Infineon components

Power devices:IMZA65R072M1H, IPW60R037CM8, IPW60R024CFD7, BSC007N04LS6  
Drivers: 2EDB9259Y, 2EDB8259Y, 2EDR8259X, 2EDN7534F, 1EDB8275F  
Microcontrollers: XMC1404-F064X0200 AA, XMC4200-F64K256BA  
Digital isolator: 4DIR1400H  
Miscellaneous devices: ICE2QR2280G, TLS202B1V50, IDP40E65D2

### Benefits

- Compact form factor
- Low component count
- Conducted/Radiated EMI: CISPR 22 class A with 6dB margin
- Harmonics: EN61000-3-2
- Surge withstand: EN61000-4-5

# For more support and references



## CoolMOS™ 8

- [www.infineon.com/600v-coolmos-8](http://www.infineon.com/600v-coolmos-8)
- [www.infineon.com/650v-coolmos-8](http://www.infineon.com/650v-coolmos-8)
- [Application note](#)
- [Cross reference](#)

## Top-side cooling

- [Application note](#)
- [eLearning](#)
- [Already released products](#)
- [PS design article](#)
- [JEDEC announcement](#)

### Application Notes:

- Some key facts about avalanche ([Link](#))
- Designing with power MOSFETs ([Link](#))
- Linear mode operation with HV MOSFETs ([Link](#))
- CoolMOS™ gate drive and switching dynamics ([Link](#))
- Optimizing CoolMOS™ to meet EMI requirements ([Link](#))
- LLC calculator (Part 1: [Link](#) Part 2: [Link](#))
- Thermal performance of SMD packages ([Link](#))
- Dynamic thermal behavior of MOSFETs ([Link](#))
- EiceDRIVER™ - Gate resistor for power devices ([Link](#))

### Trainings

- Si, SiC or GaN? The right choice for power devices ([Link](#))
- Top side cooling with high voltage packages ([Link](#))
- Meeting Electromagnetic Interference (EMI) requirements with CoolMOS™ (E2): [EN](#), [CN](#)
- Avalanche and surge for CoolMOS P7 family: [EN](#)

Please connect your regional marketing representative to request technical deep dive with experts on assembly hints and tips

