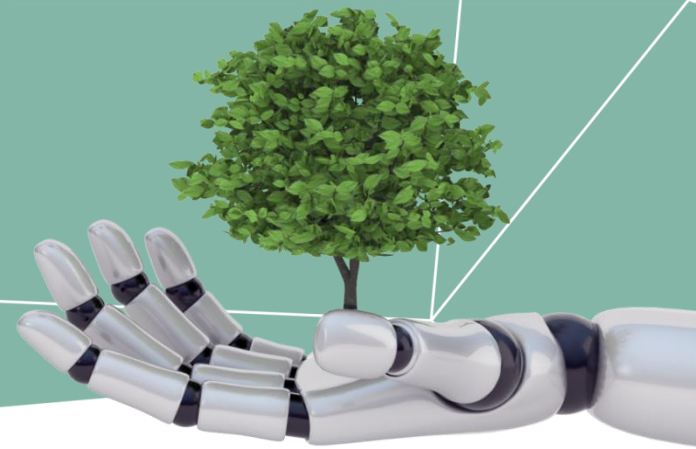


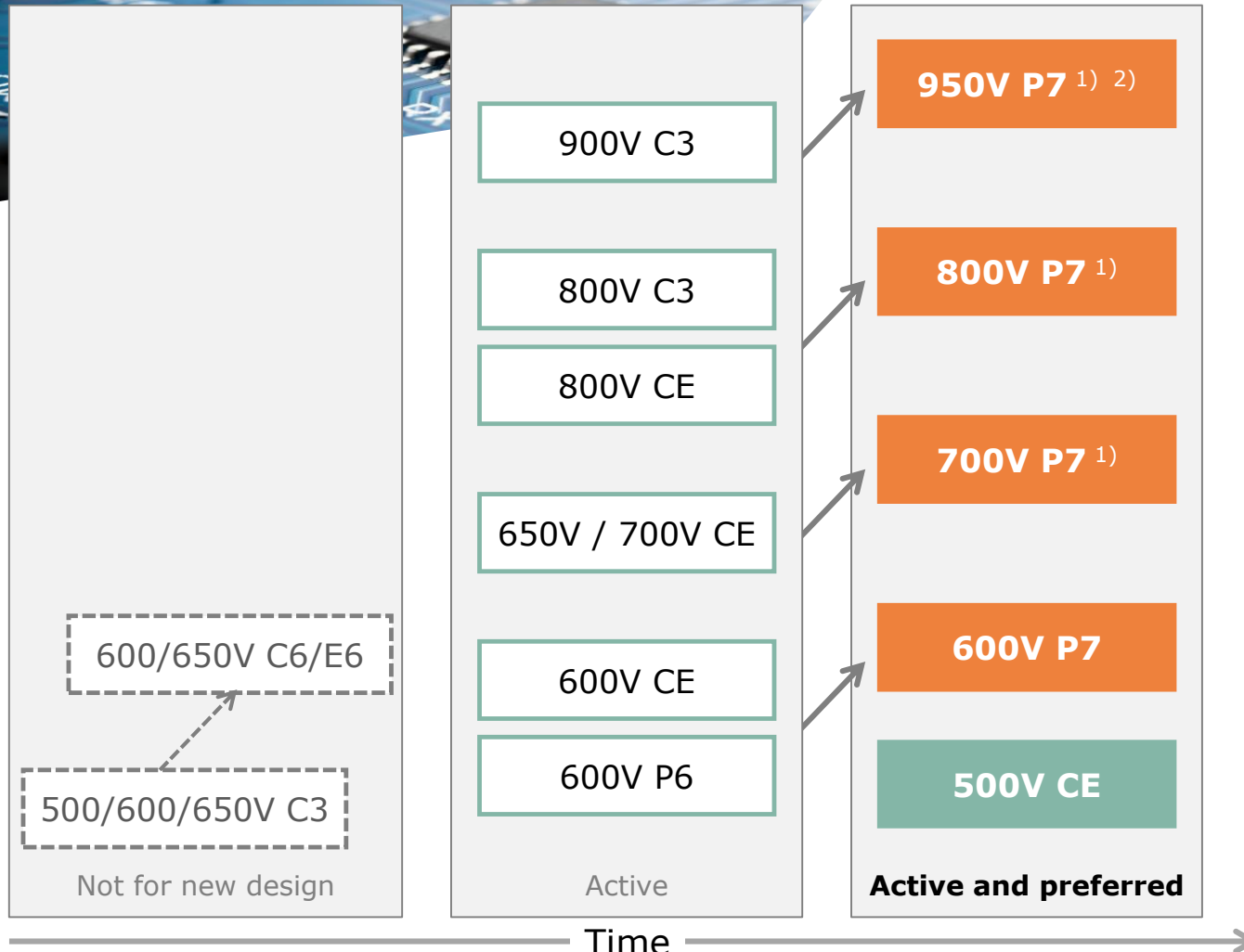
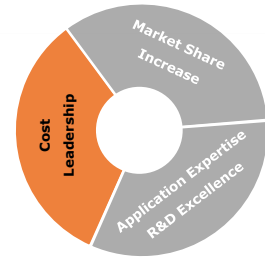
7 for growth

Products for low power applications
CoolMOS™

Harun Duyan



CoolMOS™ positioning within **Low Power SMPS/Lighting** market



P7 Series

- › Best-in-Class price/performance ratio
- › Excellent efficiency
- › Excellent thermal behavior
- › Ease-of-use technology
 - › High ESD ruggedness
 - › EMI friendly

CE Series

- › Right fit in terms of thermals/efficiency
- › Good ease-of-use level
- › Competitive price position

- High performance
- Standard performance

¹⁾ optimized for flyback topologies

²⁾ Launch scheduled for CQ3/2018

CoolMOS™ P7 within Low Power SMPS and Lighting



CoolMOS™ P7 enables you with all the power you need



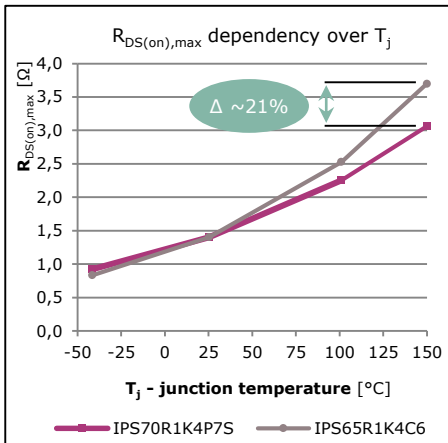
CoolMOS™ Superjunction MOSFET P7 is the **right fit** for Low Power SMPS/Lighting in terms of:

- › Competitive price position
- › Outstanding thermal behavior and excellent efficiency gains
- › Broad portfolio that fully meets customer expectations
- › Well known and established Infineon quality
- › Given long-term price roadmap compared to previous CoolMOS™ generations

CoolMOS™ P7

Technological highlights

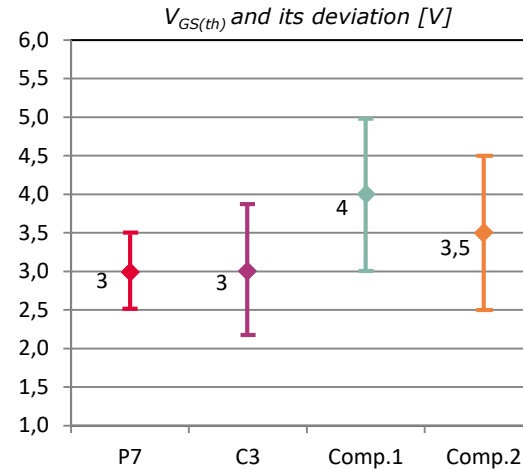
Best-in-Class $R_{DS(on)}$ dependency over T_j



CoolMOS™ P7

- › lower $R_{DS(on)}$ increase with increasing junction temp.
- › Reduced conduction losses, especially at low input voltage

Best-in-Class $V_{GS(th)}$ and lowest $V_{GS(th)}$ tolerance



Customer benefits

Easy to drive

- › Avoiding MOSFET linear mode operation
- › Allowing lower driving voltage
- › Reducing idle loss

Easy to design in

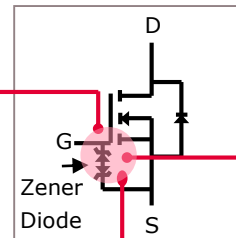
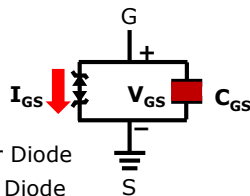
- › Increased design freedom due to tighter tolerance

Integrated Zener Diode ESD protection

ESD Protection Mechanism

During ESD event:

- › V_{GS} is clamped by Zener Diode
- › I_{GS} flows through Zener Diode
- › Thus protect gate oxide



Customer Benefits

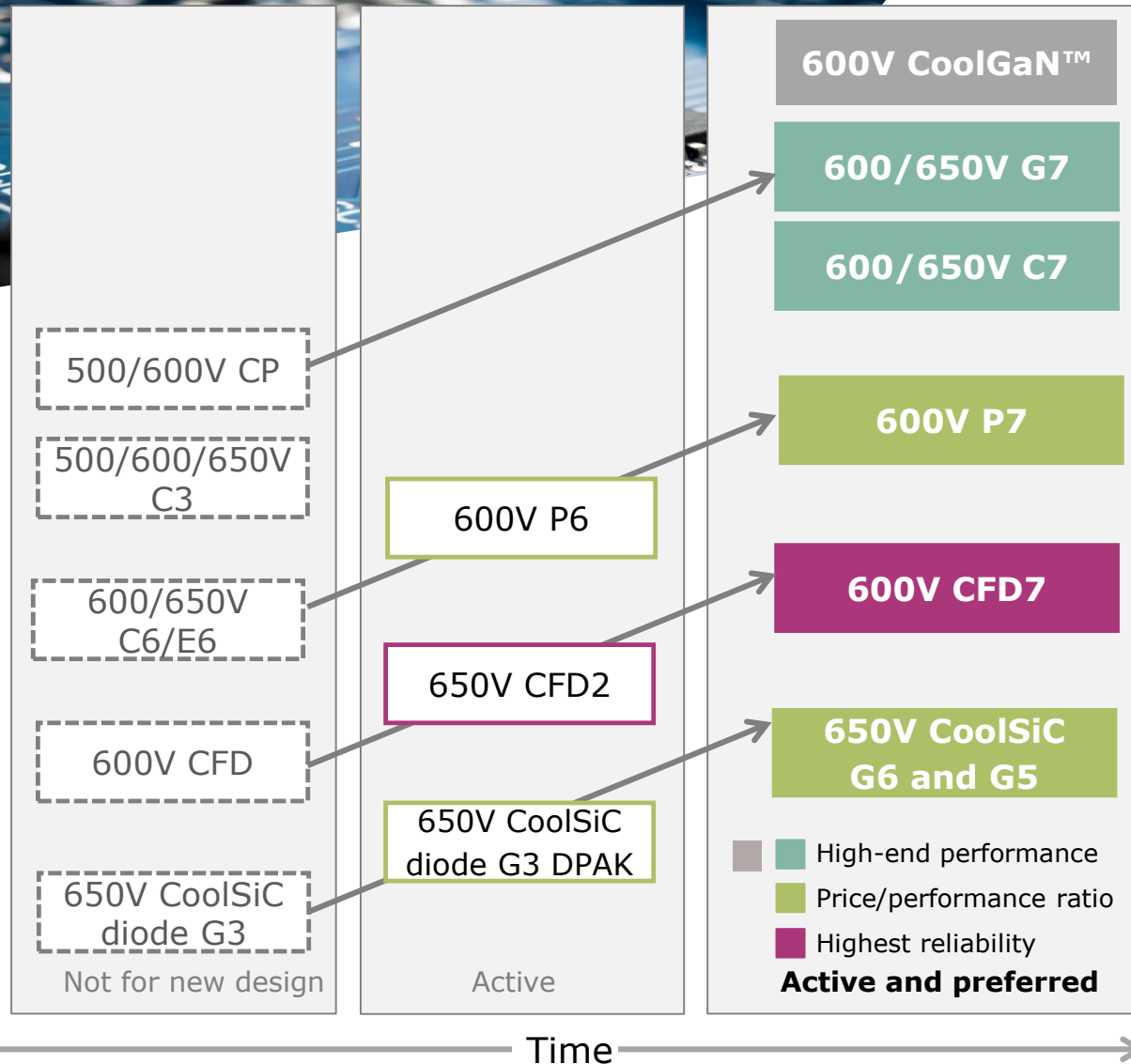
- › Better assembling yield thus less cost
- › Less field failure rate
- › Higher quality and better reputation

CoolMOS™ P7 ESD Robustness

600 V	HBM	0.12-0.60 Ω: 2-4 kV	Class 2
	CDM	>1 kV	Class C3
700 V	HBM	0.75-2.00 Ω: 1-2 kV	Class 1C
	CDM	0.36-0.60 Ω: 2-4 kV	Class 2
800 V	HBM	2.00-4.50 Ω: 1-2 kV	Class 1C
	CDM	0.28-1.40 Ω: 2-4 kV	Class 2
950 V	HBM	2.00-3.70 Ω: 1-2 kV	Class 1C
	CDM	0.45-1.20 Ω: 2-4 kV	Class 2
	CDM	>1 kV	Class C3

CoolMOS™ , CoolGaN™ & CoolSiC™

Power switches over time



CoolGaN™ CoolMOS™ C7/G7

- › High-end efficiency
- › Highest switching frequency

CoolMOS™ P7

- › Best-in-Class price/performance ratio
- › Excellent efficiency
- › Excellent thermal behavior
- › Ease-of-use technology
- › Robust

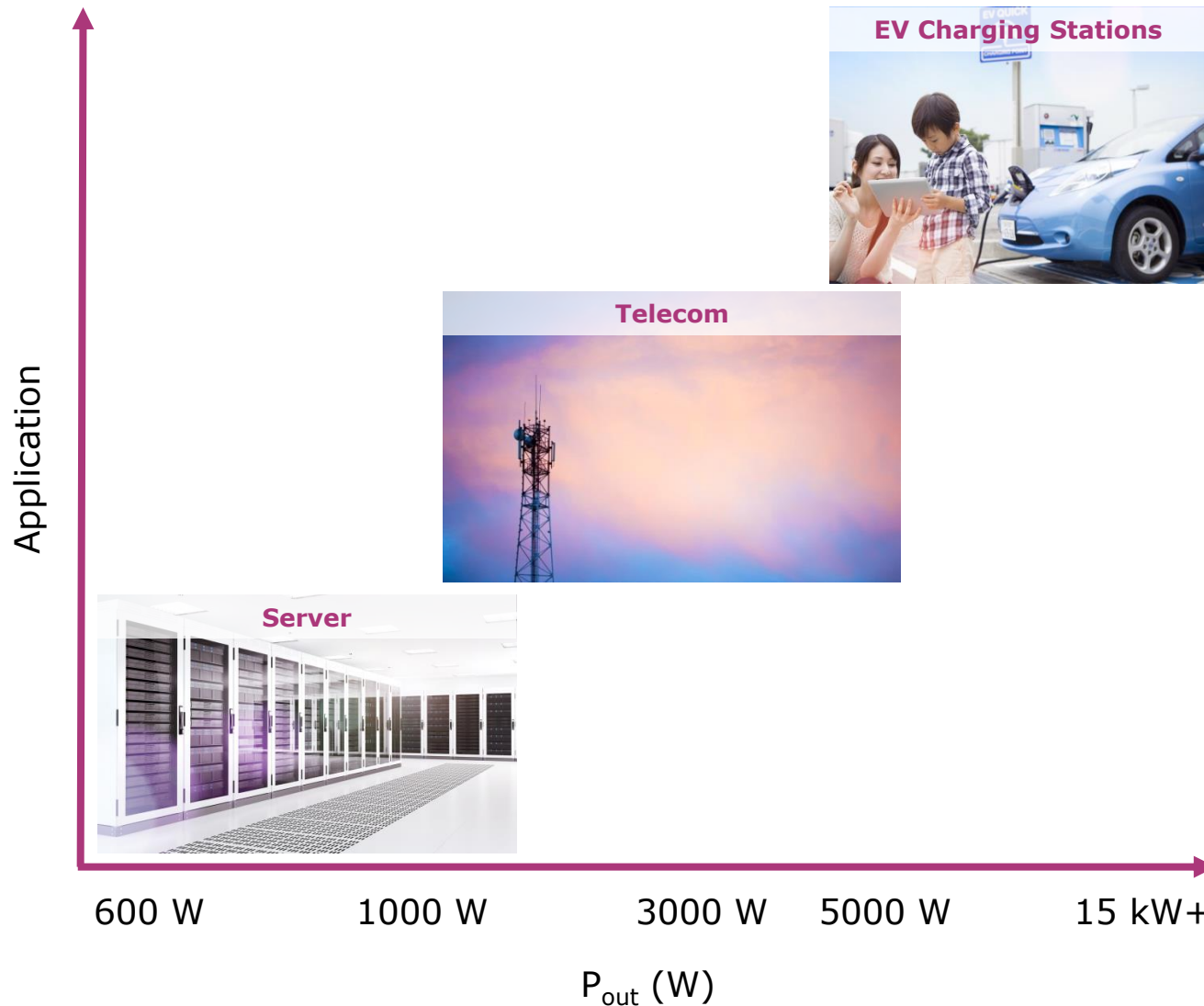
CoolMOS™ CFD7

- › Highest reliability
- › Super fast body diode
- › Perfect match for resonant switching topologies like LLC and ZVS PS FB

650V CoolSiC™ Diode

- › Best efficiency
- › Best price performance

600 V CoolMOS™ CFD7 is designed to address the high power SMPS market for resonant topologies



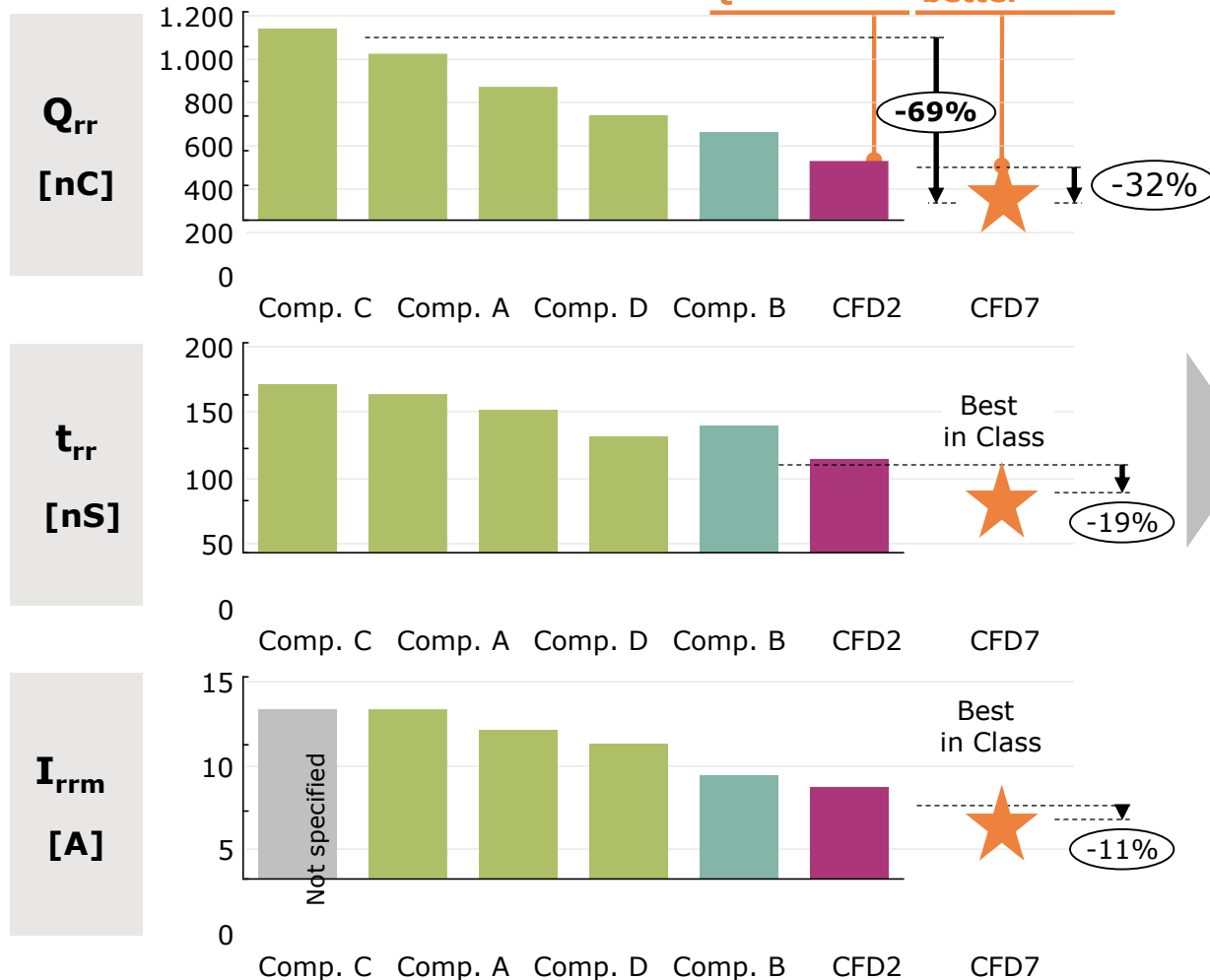
600 V CoolMOS™ CFD7 key facts

- > **Outstanding reliability** in soft switching topologies like LLC and ZVS PSFB
- > Enables **higher power density** solutions
- > **Best fit efficiency** for target markets
- > **Easy implementation** in the design-in process
- > Attractive price and competitive **long term price roadmap**



CoolMOS™ CFD7 offers the most robust and fastest body diode in the market

1 Q_{rr} , t_{rr} and I_{rrm} @ 190 mΩ range competition in comparison to 170 mΩ CFD7 in TO-247



600 V CoolMOS™ CFD7 customer benefit

With CoolMOS™ CFD7 the world's best Q_{rr} is reduced by another 32%







Compared to the main competition, CoolMOS™ offers up to 69% reduced Q_{rr}

CoolMOS™ CFD7 has the **most robust and fastest body diode** on the market and offers highest reliability in resonant topologies

NEW!

600 V CoolMOS™ CFD7 is designed to address the high power SMPS market for resonant topologies




$R_{DS(ON)}$ [mΩ] Max.	 TO-263 D²PAK	 TO-252 D-PAK	 ThinPAK 8x8	 TO-220	 TO-220 FullPAK	 TO-247
360	IPB60R360CFD7	IPD60R360CFD7		IPP60R360CFD7	IPA60R360CFD7	
280	IPB60R280CFD7	IPD60R280CFD7		IPP60R280CFD7	IPA60R280CFD7	
210/215	IPB60R210CFD7	IPD60R210CFD7		IPP60R210CFD7	IPA60R210CFD7	
170/185	IPB60R170CFD7	IPD60R170CFD7	IPL60R215CFD7	IPP60R170CFD7	IPA60R170CFD7	IPW60R170CFD7
145/160	IPB60R145CFD7	IPD60R145CFD7	IPL60R185CFD7	IPP60R145CFD7	IPA60R145CFD7	IPW60R145CFD7
125/140	IPB60R125CFD7		IPL60R160CFD7	IPP60R125CFD7	IPA60R125CFD7	IPW60R125CFD7
105/115	IPB60R105CFD7		IPL60R140CFD7	IPP60R105CFD7		IPW60R105CFD7
90/95	IPB60R090CFD7		IPL60R115CFD7	IPP60R090CFD7		IPW60R090CFD7
70/75	IPB60R070CFD7		IPL60R095CFD7	IPP60R070CFD7		IPW60R070CFD7
55/60			IPL60R075CFD7			IPW60R055CFD7
40			IPL60R060CFD7			IPW60R040CFD7
31						IPW60R031CFD7
24						IPW60R024CFD7
18						IPW60R018CFD7


CoolMOS™ CFD7 to be released in **TOLL, DPAK & QPAK**





Released


Coming soon


SMPS


PC Power


Server


Telecom


EV-Charging

CoolMOS™ CFD7 demoboards

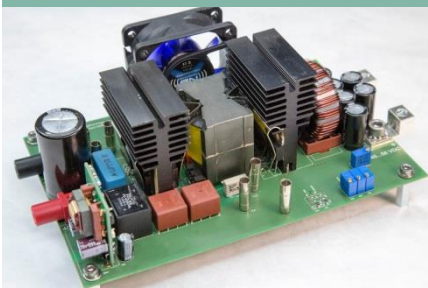
Available

800 W ZVS board



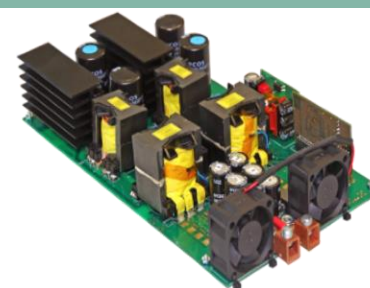
OPN: EVAL_800W_ZVS_FB_CFD7

2 kW ZVS board



OPN: EVAL_2kW_ZVS_FB_CFD7

3 kW LLC board



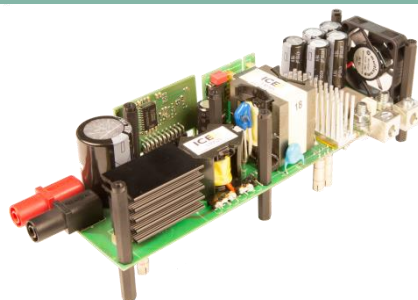
OPN: EVAL_3kW_LLC_FB_CFD7

Coming soon

1.4 kW ZVS board



600 W LLC board



More information on
www.infineon.com/cfd7

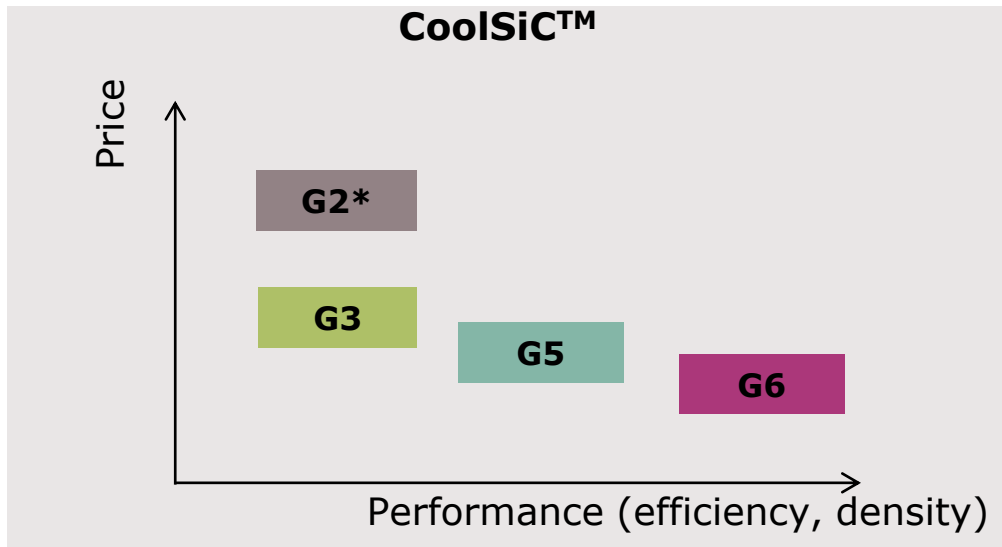


CoolSIC



NEW! 650V CoolSiC G6 Diode

Best price performance



*Gen 2 is discontinued

The new Silicon Carbide diodes of generation 6 optimally leverage Infineon's leading technology for SiC Schottky barrier diodes

Features

- > Unmatched forward voltage V_F : **1.25 V**
- > Best-in-class figure of merit $Q_c \times V_F$ - **17% less than G5**
- > High switching performance

Benefits

- > Outstanding efficiency
- > Enables higher power density
- > Best price performance

Infineon CoolSiC portfolio

Diodes

650V G6 / G5 / G3

PAK
TO-220-2
THINPAK
D2PAK
TO-247-2



SMPS – SERVER TELECOM INDUSTRIAL



LIGHTING



EV
CHARGING



PC POWER



1200V G5

PAK
TO-220-2
TO-247-3



SOLAR INVERTERS



UPS

Mosfets

1200V

TO-247-3
TO-247-4



SOLAR INVERTERS



BATTERY CHARGING AND ENERGY
STORAGE

Modules

1200V

Easy 1B Press Fit



SOLAR INVERTERS



BATTERY CHARGING AND ENERGY
STORAGE



Infiniteon MOSFETs overview

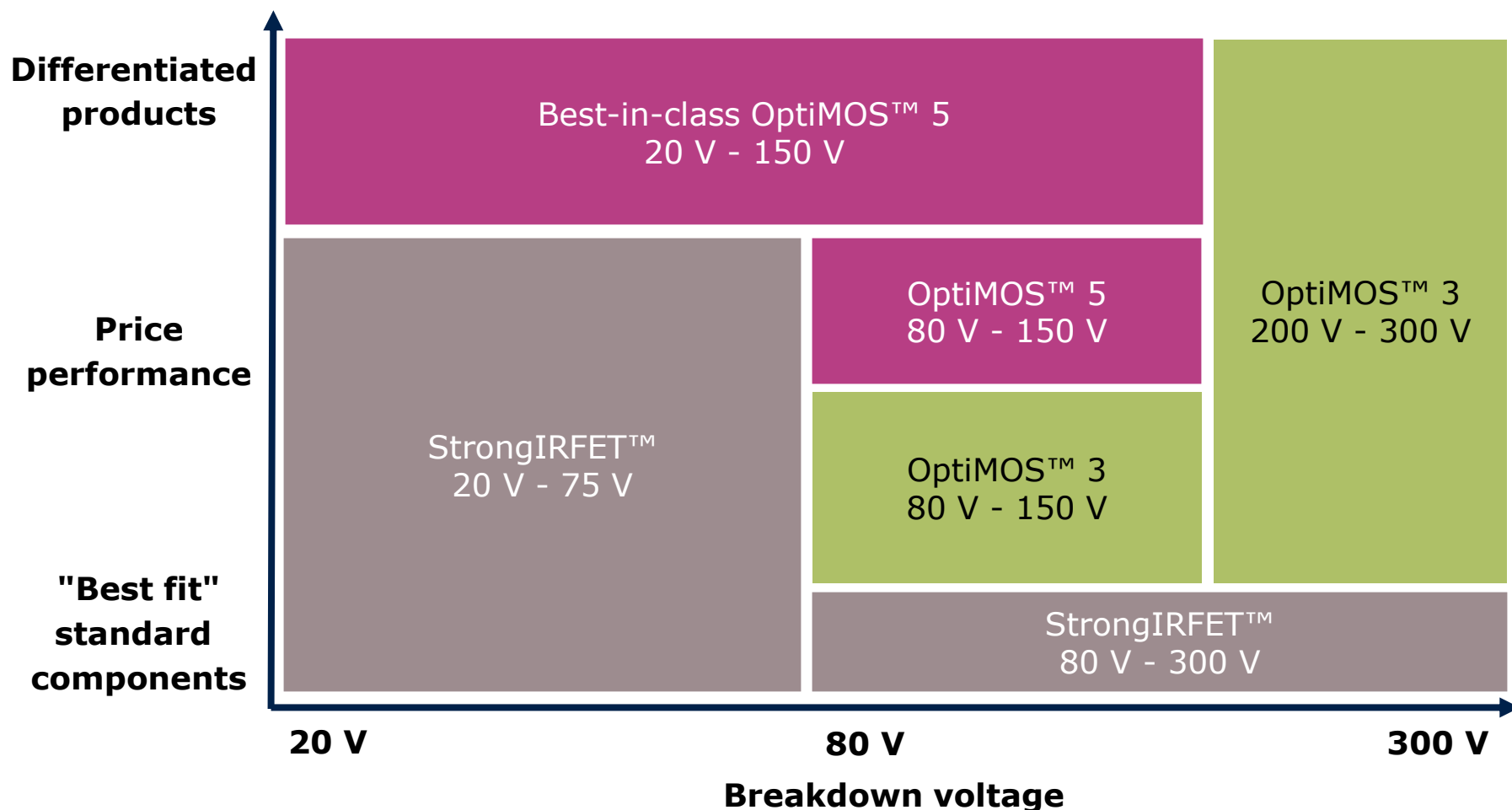
OptiMOS™ & StrongIRFET™

Bob Ng, Jifeng Qin, Peter Blaschitz
February 2018



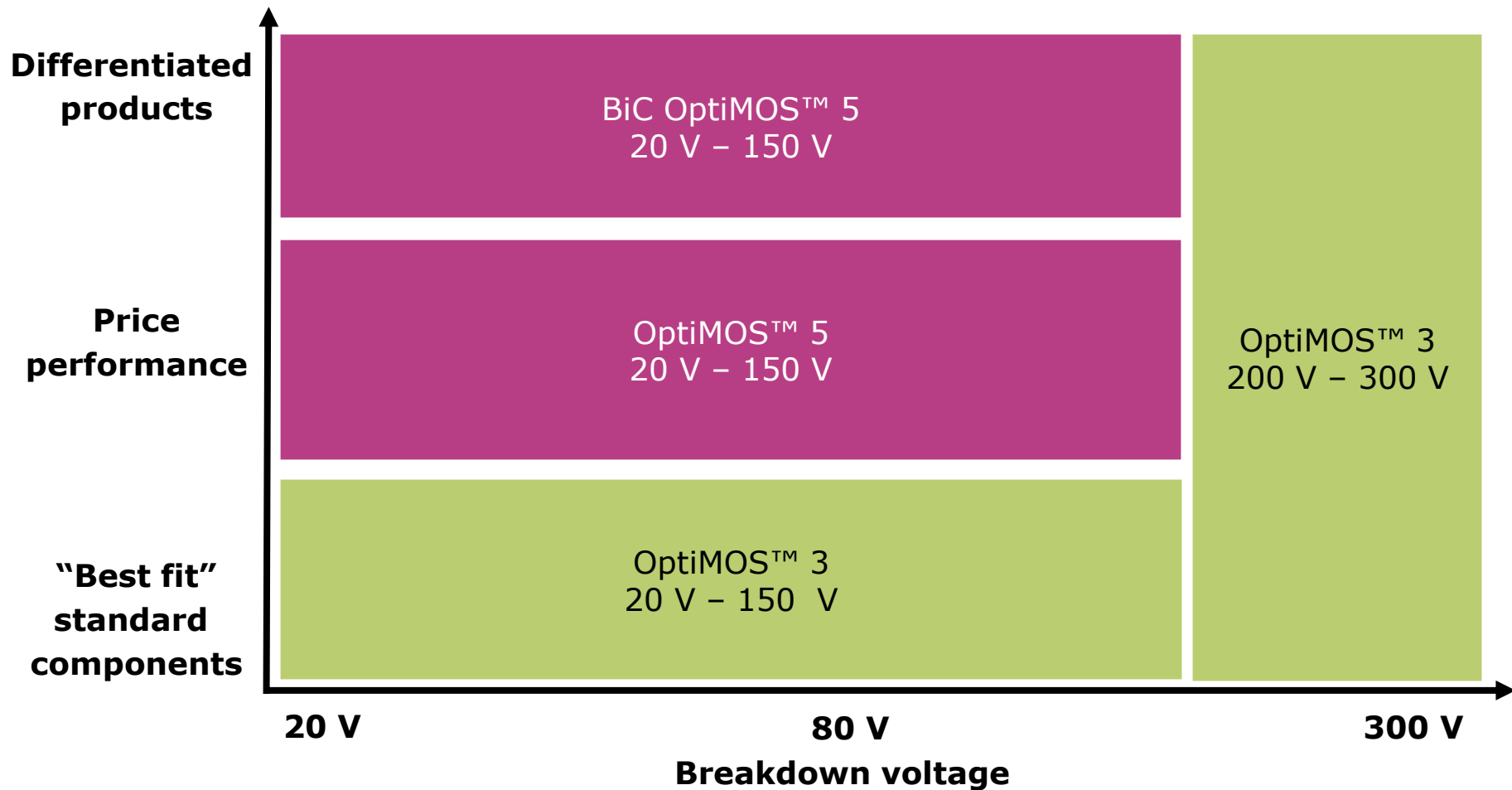
Positioning

Low frequency applications < 100 kHz

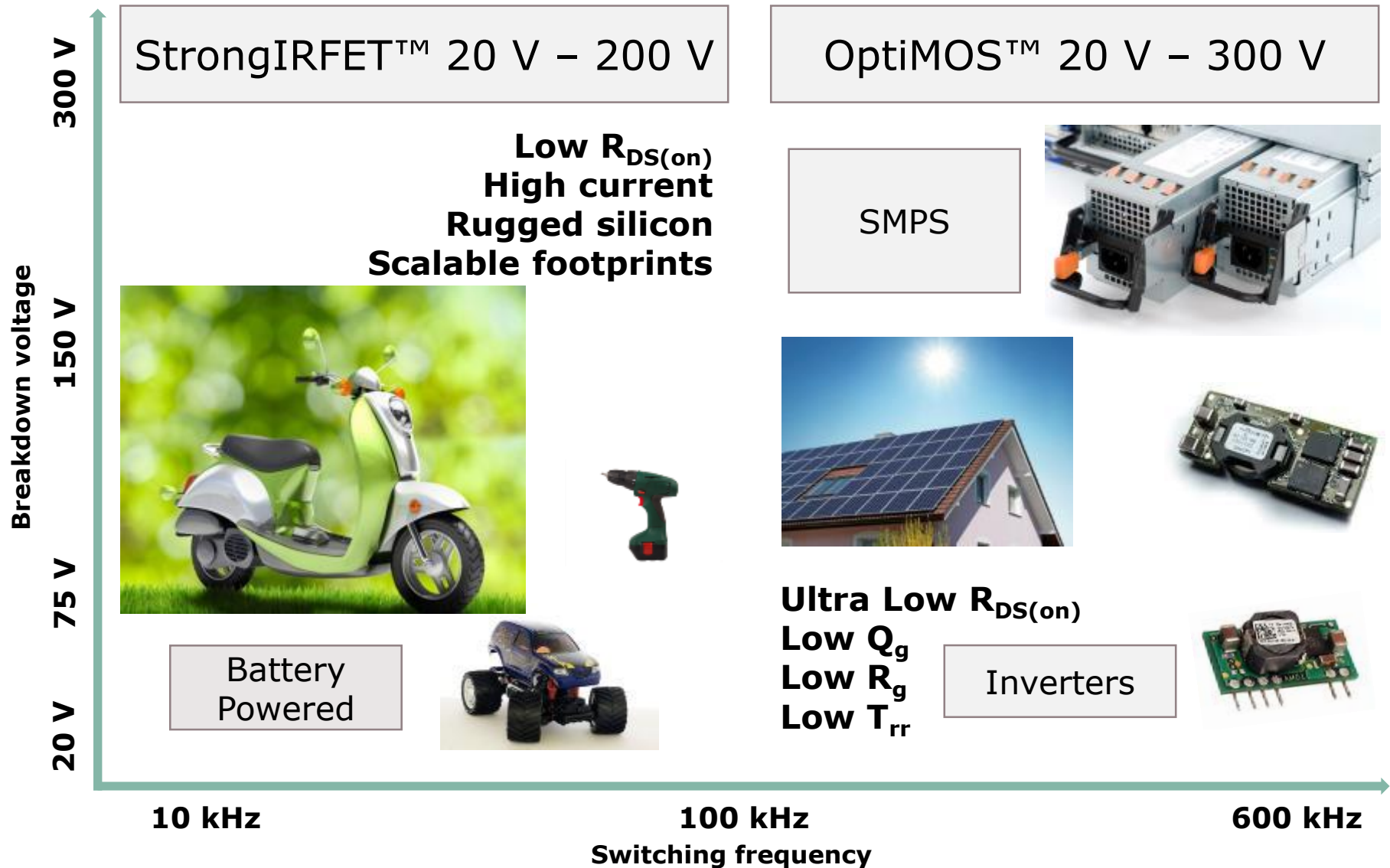


Positioning

High frequency applications > 100 kHz



Product recommendation by switching frequency



Main Messages to remember

- › CoolMOS™ 500V-950V
 - › Lower Power Applications (<300W): P7 CoolMOS™
 - › Higher Power Applications (>300W): C7 and CFD7 CoolMOS™

- › SiC Diodes
 - › Gen5 and Gen6

- › MOSFETs 20V-300V
 - › Lower Frequency (<100kHz): StrongIRFET™
 - › Higher Frequency (>100kHz): OptiMOS™ 5



Part of your life. Part of tomorrow.

