

Application Wind

PCIM 2014, Nuremberg



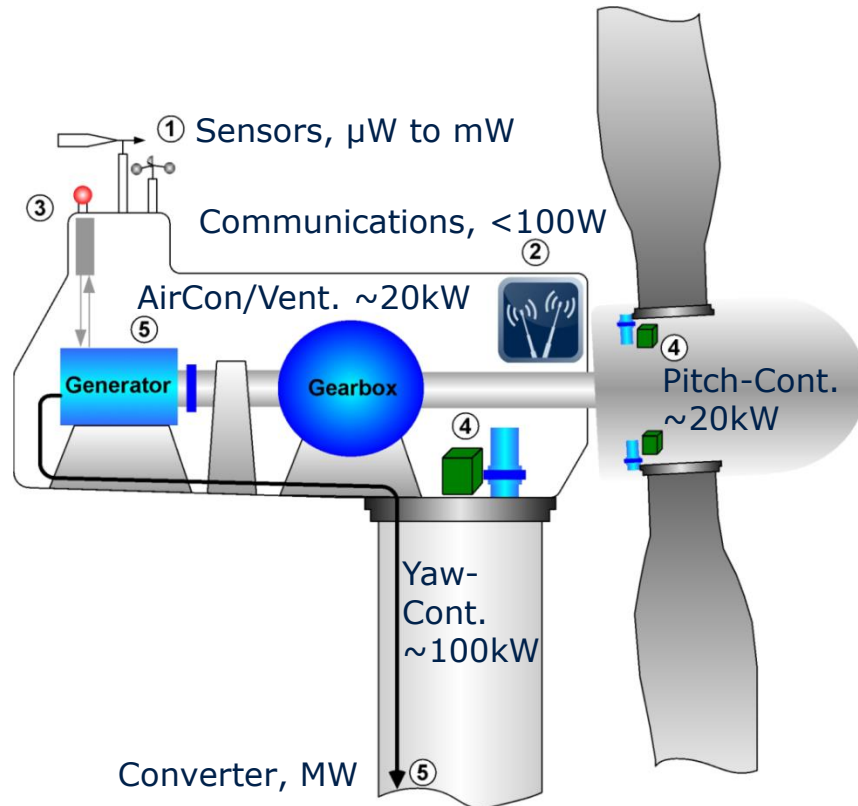
Application Needs – Requirements to modern Wind Turbines



Flexible System Availability to secure reliable Power Supply

- Sustainable power generation under grid requirements
- Reliable system
- High availability
- Low maintenance
- Usage expectation of 25 years
- Environmentally safe and public acceptance

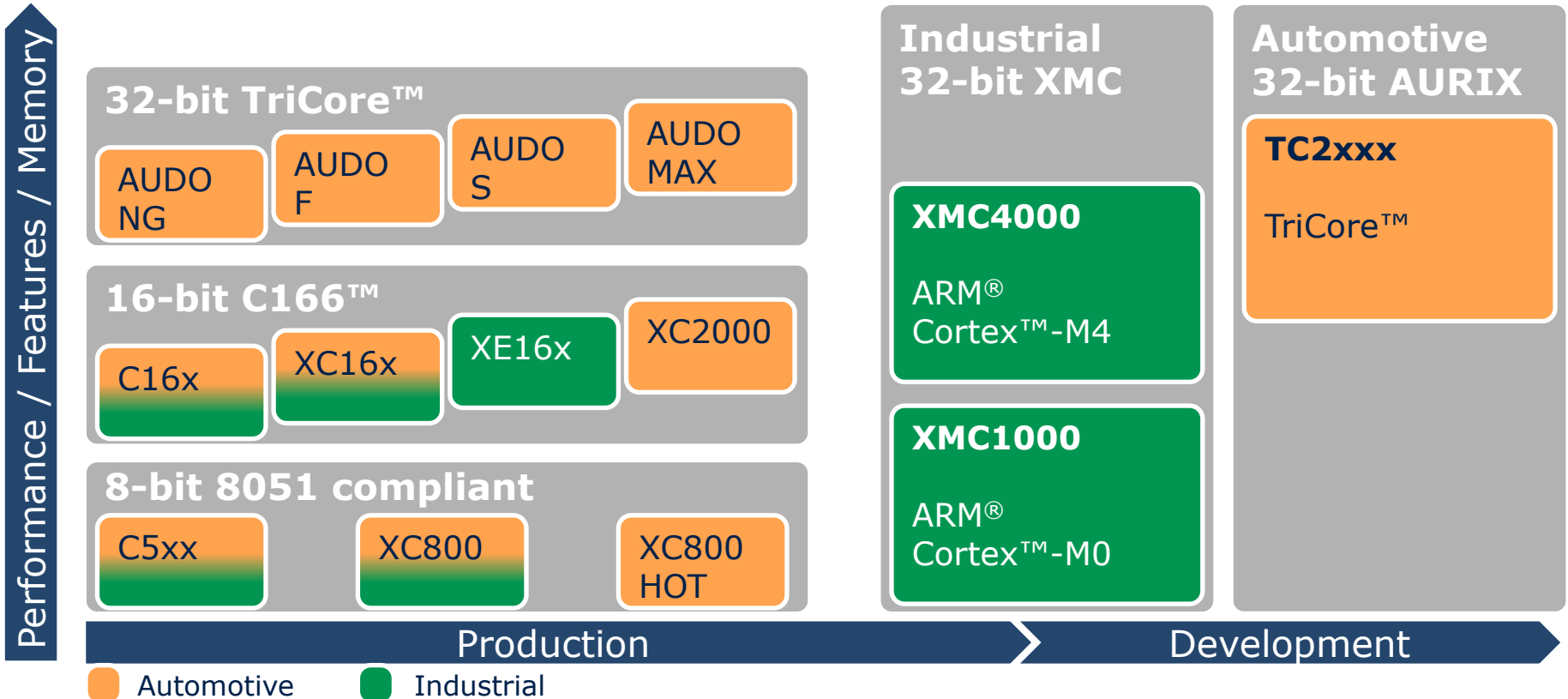
Elements of modern Wind Turbines – A Look into the Nacelle

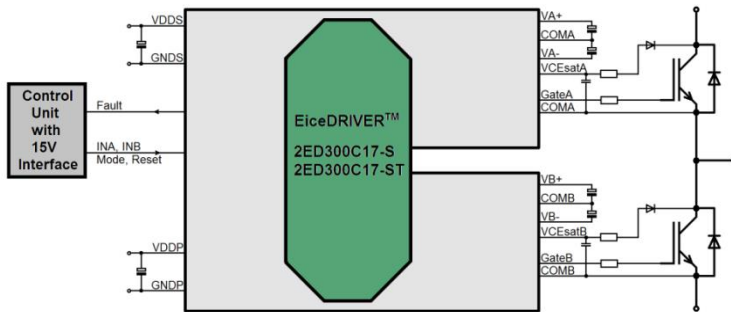


- (1) Measurement for Wind Speed and Direction
- (2) Communications
- (3) Air-Condition and ventilation
- (4) Geared Motors for Yaw- and Pitch-Control
- (5) Generator and Grid Side Inverter

**Infineon offers the
Application Portfolio!**

Infineon Microcontrollers enable Customers to differentiate





Dual Channel Gate Driver Board

- For all Infineon IGBT Modules up to 1700V
- High peak Output Current of 30A
- Integrated DC-DC SMPS

Key Benefits

- Reinforced Isolation according to EN 50178 / IEC 61800-5-1
- Large partial discharge Test Voltage of 1920V_{rms}
- Patented paralleling of IGBT Modules
- Safe Operation, even in noise-intense industrial environments
- Outstanding protection features

EconoDUAL™ 3

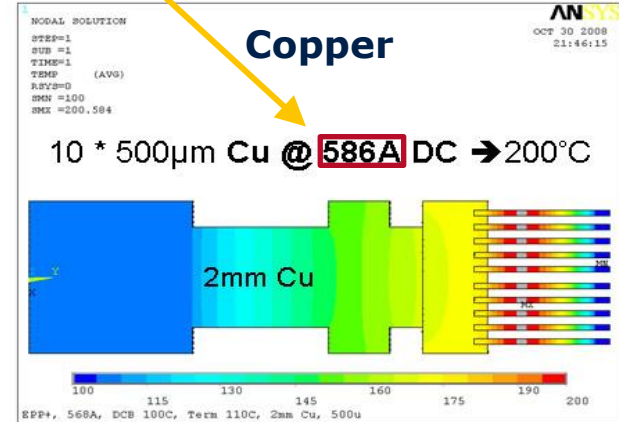
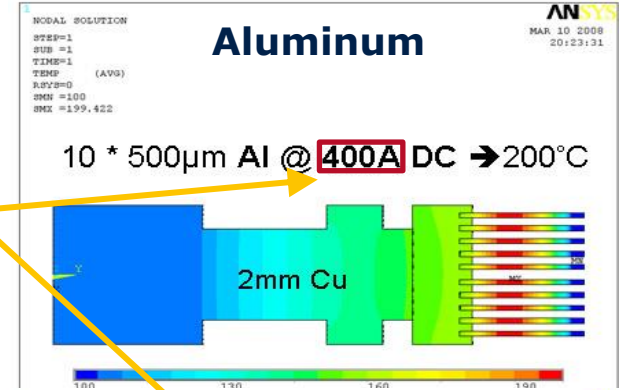
Highest Power Density with Copper Bond Wires



Copper Bond Wires
reduce Module
Lead Resistance

FF600R17ME4

- Highest Power Density
- Same Footprint as standard EconoDUAL™3



EconoPACK™ + D-Series Offering to the Customer...



FS500R17OE4D

High Power Solution due to ...

- ... Best in Class Power Density
IC = 500 A; Vce = 1700 V
- ... design for Paralleling
- ... optimized thermal interface by TIM
- ... stronger 600 A Diode for generator operation

High Reliability of Inverter due to..

- ... lifetime increase
- ... new EconoPACK™+ D-Series Design

Compact Inverter Design due to...

- ... low hight of package
- ... driver pressed on top

High Power Modules

	FF1200 R17KP4_B2	FZ1600 R17HP4_B21	FZ2400 R17HP4_B28	FZ1200 R45HL3	FF1000 R17IE4	FF1400 R17IP4
Package						
Standard Housing	✓ IHM	✓ IHM	✓ IHM	✓ IHV	✓ PrimePACK™	✓ PrimePACK™
CTI	>250	>600	>600	>400	>400	>400
High DC Stability	👍	👍	👍	👍	👍	👍
Excellent Robustness	👍	👍	👍	👍	👍	👍
Superior Power Cycle Capability	👍	👍	👍	👍	👍	👍
Operating Temperature	-40...+150°C	-40...+150°C	-40...+150°C	-50...+125°C	-40...+150°C	-40...+150°C

PrimePACK™

Offering to the Customer...



High Power Solution due to ...

- ... Best in Class Power Density
 $I_C = 1400 \text{ A}; V_{ce} = 1700 \text{ V}$
- ... modular design optimized for paralleling
- ... reduced R_{thJH} with pre-applied TIM
- ... B2 Version for extended Load Cycle Capability
- ... package suitable for next silicon and technology generations

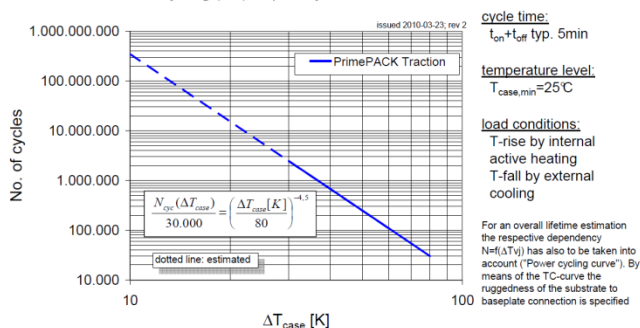
Compact Inverter due to...

- ... low Inductive Design
- ... better Thermal Performance

DF1000R17IE4
FF1000R17IE4
FF1400R17IP4

FD1000R17IE4
FF1000R17IE4D_B2

Thermal Cycling (TC) Capability for PrimePACK™ Traction (_B2 Version)





6MS10017E41W36775

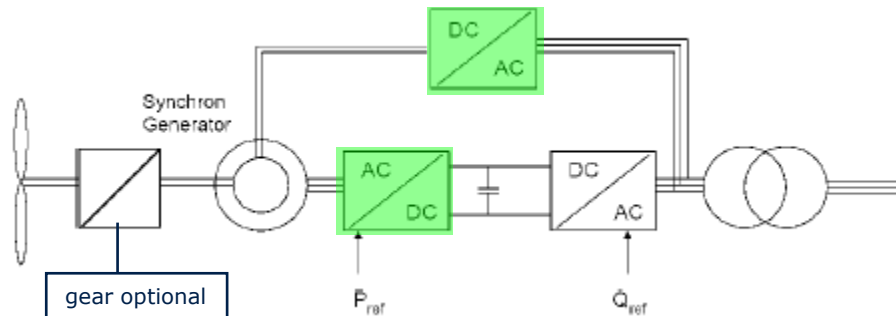
Performance characteristic

- 3-phase Full Bridge B6I up to 690kW
- 1700V IGBT4
- Dimension: 338 x 596mm
- Weight: 45kg

Key Benefits

- High Power Density utilizing PrimePACK™ Modules
- High efficiency liquid Heatsink
- DC Link Capacitor Bench
- Driver electronics and protection mechanism
- Robust design and reinforced driver isolation

Rectifier and Excitation for synchronous Generator



Configurations

- Typical Converter Power: up to 5 MW
- Typical topology:
Rectifier e.g. B12 with thyristors
Excitation e.g. B6 with PowerBLOCK Modules

Typical Types



T3160N18TOF



TT520N22KOF

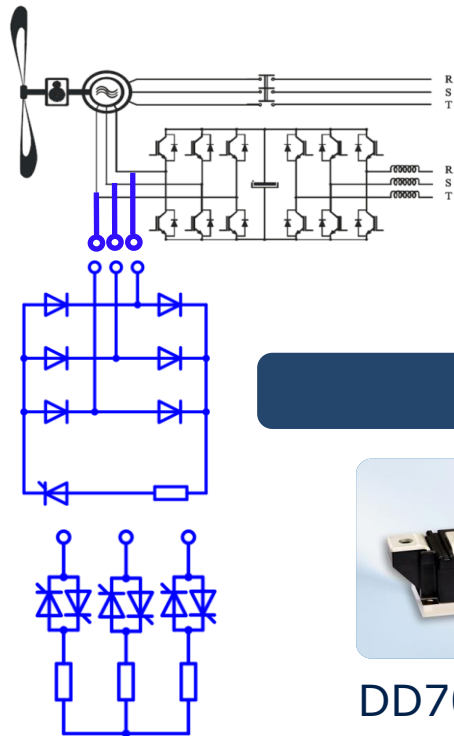
New



TT260N22AOF

Product Features

- Short on fail
- High overload capability
- High Reliability and lifetime



- Crow bar with B6 rectifier and thyristor
- Crow bar with W3C circuit

DD700N22K
TT520N22KOF

New



DZ1070N22K
TZ810N22KOF

New

- Short on fail
- High overload capability
- High reliability and lifetime
- Long term DC Stability



ENERGY EFFICIENCY MOBILITY SECURITY

Innovative semiconductor solutions for energy efficiency, mobility and security.

