

Application Transportation







PCIM 2014, Nuremberg



Vehicles in Electric Transportation

Types, typical Power and related IFX Product Family

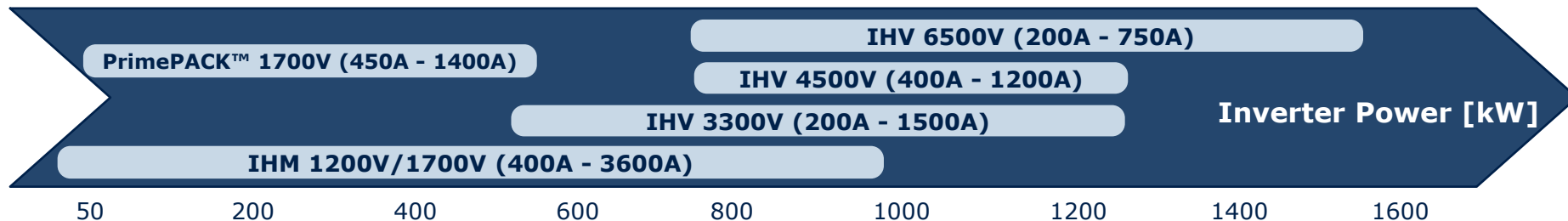


	Tram / Streetcar	Trolleybus	Metro Car / Underground	Passenger Coach / Suburban	High Speed Train	Locomotive
						
Typical power	200kW – 400kW	100kW – 200kW	800kW	0.8MW – 2.0MW	8.0MW – 10MW	6.4MW – 9.6MW
Catenary voltage	600V DC	600V DC 750V DC	600 VDC 750 VDC 1500 VDC	Variable	Variable	Variable
IGBT product family	IHM and PrimePACK™	IHM and PrimePACK™	IHM / IHV and PrimePACK™	IHV	IHM / IHV	IHV

Vehicles in Electric Transportation

From Application to rough Product Portfolio

IFX Portfolio	1700V PrimePACK™	1200V IHM	1700V IHM	Upgrade		4500 V IHV	6500 V IHV
				3300 V IHV			
Dual	450A – 1400A	400A – 1200A	400A – 1200A	200A, 400A		-	-
Single	-	1200A – 3600A	1200A – 3600A	400A – 1500A		800A – 1200A	250A – 750A
Chopper	650A, 1000A	600A – 1600A	600 A – 1600A	400A – 1500A		800A	400A, 500A
Diode	-	400A – 3600A	400 A – 3600A	400A – 800A		400A – 1200A	250A – 750A



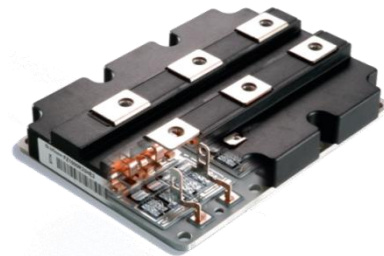
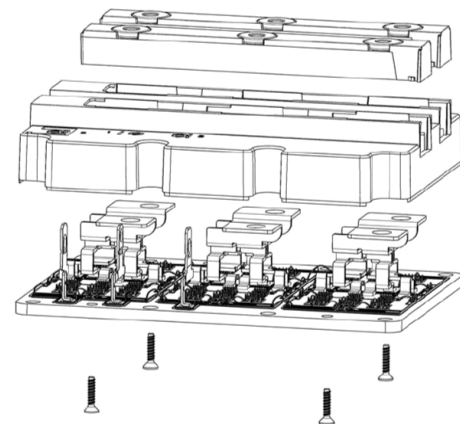
Continuous Product Upgrades

Enhanced IHM-B 1700V

- R_{thjc} Improvement of $\sim 17\%$ by changing to AlN
- Improved Power Cycling (+100%) via optimized Chip Bond Connection
- Very low effort on requalification
- Role-out to the whole IHM AlSiC Product-range
(Various Single Switches, Chopper- and Diode-Modules)
till summer 2014

Enhanced IHV-B 3.3kV

- R_{thJC} Improvement of $\sim 13\%$ by changing to AlN
- Very low effort on requalification
- In series production



Infineon provides the broadest Portfolio for CAV Applications



PrimePACK™ for CAV Application

CAV Modules

Chopper

DF600R12IP4DV

DF900R12IP4DV

FD900R12IP4DV

Half-bridge

FF600R12IE4V

FF600R12IP4V

FF650R17IE4V

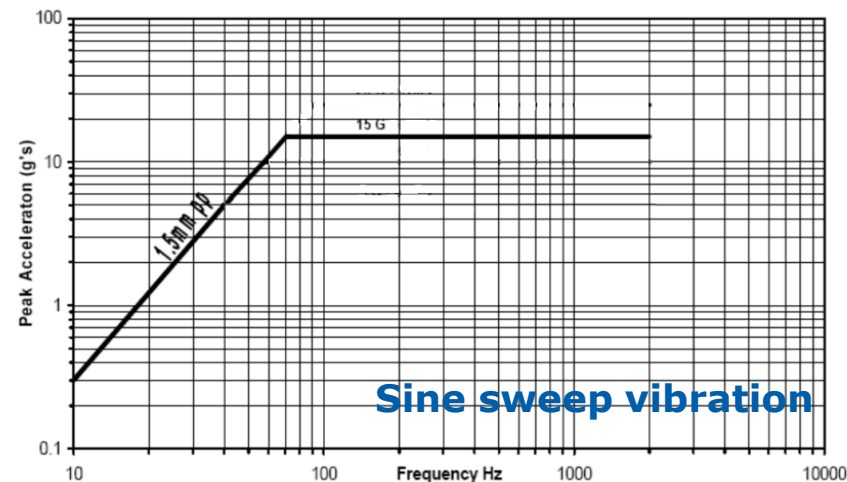
FF900R12IE4V

FF900R12IP4V

FF900R12IP4DV

New Suffix CAV:
FFxxxR1xIx4V

**Available
from June
2014**



Vibrational Robustness

- Sinusoidal Vibration Test
- Logarithmic Sweep from 10 ... 2000Hz
- Acceleration limit of 104,0m/sec² RMS (15g peak) from 70.5 ... 2000Hz

Extended Reliability and Next Level of Traceability

Improved System Soldering
for **extended Thermal
Cycling capability**

Enhanced Traceability
by additional DMX Chip

- On substrate
- On frame

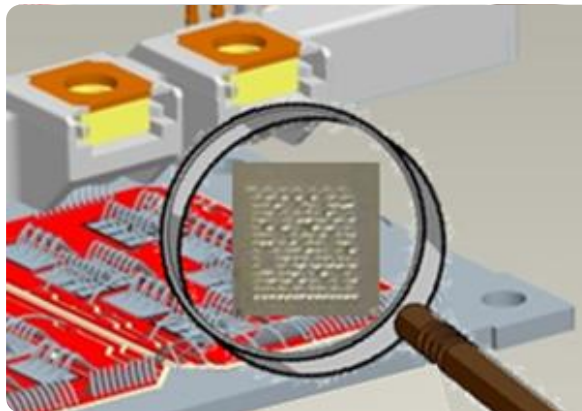
**Qualified according to
automotive Standards**

- Extended Vibration Test
- 1000 Cycles Thermal Shock test

Extension

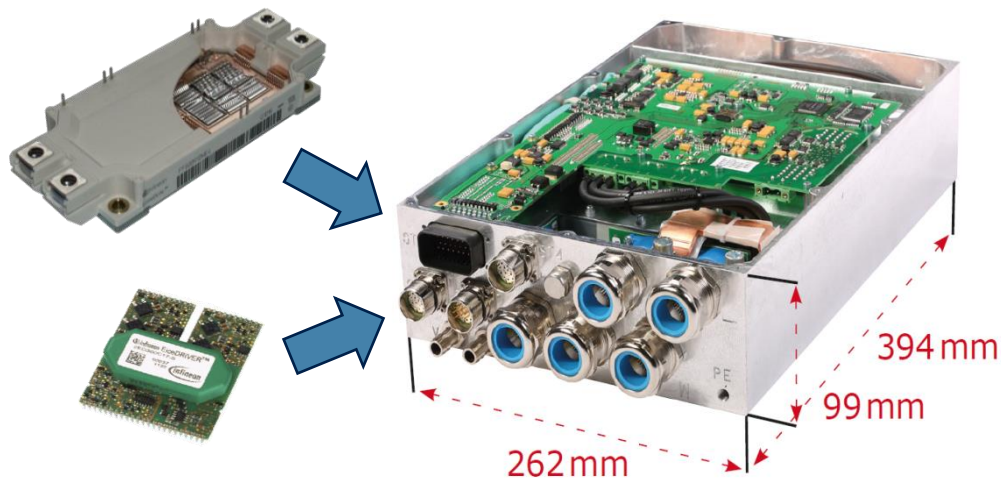
3x

Standard



ARADEX VECTOPOWER:

- The allround Inverter
- 350kVA peak Power in a 10l housing
 - Scalable up to 1.6MW
- Excellent Price/Power-ratio through Infineon Technology inside:
 - 3x FF600R12ME4_B11
 - Great Power Variety
 - Excellent Price/Power-ratio
 - 3x EiceDRIVER™
 - Good Isolation Class
 - High PWM Frequencies
- Certified for harsh Environment (IP65, IEC60068-2-64 and -27)



More Infos at: www.aradex.com

Infineon enables a perfect Hybrid-Drive ARADEx VECTOPOWER

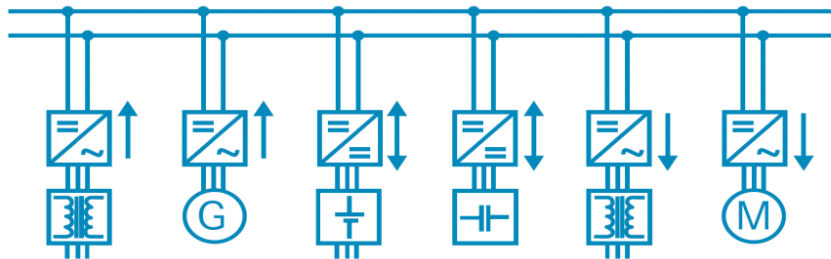
powered by 

Application examples with VECTOPOWER

- Diesel-hybrid Town Busses
 - Easy-to-use Solutions
 - Up to 30% Energy Savings
- Diesel-hybrid Excavator
 - Up to 15% Time Reduction
 - Up to 25% Energy Savings

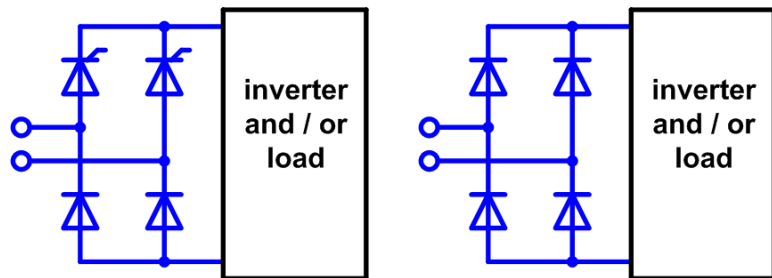
Customer benefits

- Excellent Price/Power-ratio through Infineon Products
- 6 Functions, one Device
 - AFE Function to the Grid
 - DC/DC SuperCap
 - Generator Function
 - Auxiliary Power Unit
 - DC/DC Battery Coupling
 - Traction Drive



More Infos at: www.aradex.com

Auxiliary Power Supplies



typical Module Types



TD305N16KOF **New**



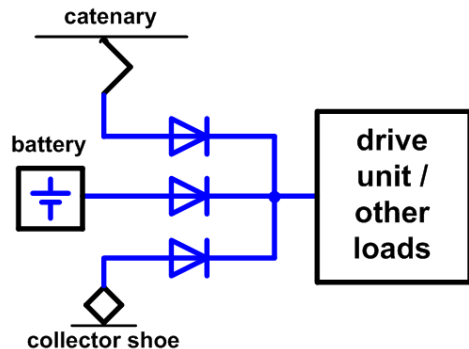
DD435N36K

Customer Benefits

- Broad Portfolio
- High Reliable Pressure Contact Technology
- Isolated Base Plate
- High Blocking Voltages (V_{RRM} / V_{DRM})



Decoupling Diodes



Customer benefits

- Broad portfolio
- High Reliable Pressure Contact Technology
- Modules with Isolated Base Plate
- High Blocking Voltages (V_{RRM}) available



D452N18E
D251N20B
D400K18B
D475N38B



ND89N18K
ND104N18K
ND350N18K



ND260N18K
ND261N26K
ND350N18K



DZ435N40K
DZ540N26K
DZ600N18K
DZ700N22K



DZ950N44K
DZ1070N26K

AURIX™ in Commercial Vehicles – Setting Trends

AURIX™ – Safety joins Performance



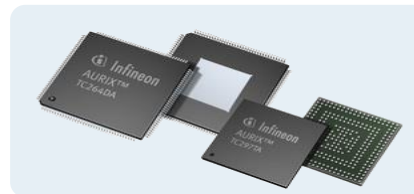
Performance

- Clockrate up to 300MHz
- Multi-core Technology
- Floating-point Unit
- Ta: 145 °C
- Standby Control Unit



Functional Safety and Security

- ISO26262 Platform Safety Concept
- 32-bit Programmable Security Hardware
- HW/SW Safety Features



Scalability

- Up to 3 x TriCore™
- Up to 2.7MB SRA
- 512k – 8MB Flash
- 48k – 2.7MB RAM
- Pinout Compatibility



Enablement

- ACT Configuration Tool
- Free Tool Chain
- Preferred Design House Support
- Latest connectivity

Automotive Quality Standards

Long-term Supply Availability and Supply Security

PROFET™ Key Features

- >58V Voltage Rating
- Current Limitation
- Protection against Loss of Battery and GND
- Reverse Battery Protection
- Short-circuit Protection
- Overtemperature Protection
- Overvoltage Protection
- ESD Protection
- (Partly) Proportional Load Current Sense
- Productrange 2.5 – 1000mΩ



www.infineon.com/profet

HITFET™ Key Features

- Innovative, robust and high-performance low side Switches
- Overcurrent & -temperature protection
- Overvoltage protection
- ESD protection
- Diagnostic feedback
- Switching speed controlled by design

www.infineon.com/hitfet

Key Applications

- Relay Driver
- Small load driver





ENERGY EFFICIENCY MOBILITY SECURITY

Innovative semiconductor solutions for energy efficiency, mobility and security.

