

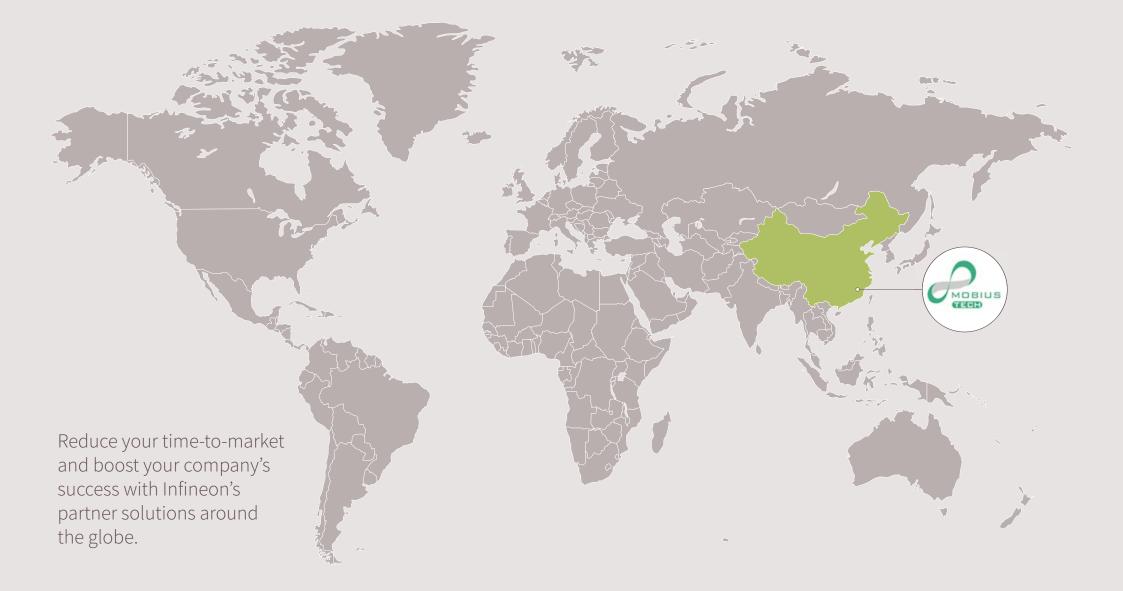
Your benefit are our partners

Associated partner guide



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Trust in Infineon and our partner



Modular multi-level topology is the solution for 2nd life of battery

- Fixed battery pack Central inverter Power electronics The weakest cell determines the The weakest cells affect the usable capacity of the battery pack usable capacity of each module Soc Cells of battery pack Module 1 Module 2 Module 3

Battery utilization - IGBT based systems vs. multi-modular approach

Modular multi-level topology solution to 2nd life of battery

- > Maximize the useable battery capacity
- > Increase the life time of overall system
- > Maximize system availability
- > Reduce operating cost with lower voltage maintenance
- > Increase efficiency

Dynamically

linked battery modules

Σ

- > Active battery management at module level will be achieved
- Re-use of discarded EV batteries independent of State-of-Charge (SOC)

Usage of low voltage OptiMOS[™] FETs for highest efficiency compared to traditional central inverter systems

SOC

Increased reliability and usable capacity plus fail-safe system due to no one-point of failure Power density of system, e.g. less space due to less magnetics and lower BOM Active battery management (BMS) at module level will be achieved "for free"

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Store more energy with a decentralized power conversation

Energy storage container system

Gas fire protection system

> Gas, temperature, smoke, flame sensor
> Intelligent warning, leakage warning
> Real-time analysis, intelligent judgment

System based

- > High strength container matrix
- > Design for infrastructure
- > Fireproof material,
- insulation and isolation

Lighting System

- > General Lighting
- > Emergency Lighting

Temperature Control System — > Ventilation and Exhaust System

- > Automatic Temperature Control System
- > Duct Design, Accurate Air Supply

Battery and BMS system -

- Different types, brands and models of batteries can be used at the same time in one system
- Cascade battery BMS can be used directly or equipped with new BMS
 Direct use of the cascade battery

– PCS

- Modular & Intelligent Energy Storage Power Converter System (PCS)
- Heterogeneous Compatibility with Different Types, Models, Brands of Batteries
- Fault-tolerant redundancy design does not affect the grid connection in case of some module failure
- > High Efficiency and High Power Quality

EMS Management System

> Data Acquisition/Data Communication
> Data Analysis/Data Storage
> Status Monitoring/Operation Analysis

Entrance Guard System
> Escape Door
> Emergency Release System



Increase efficiency and subsequently available system capacity



High energy consumption enterprises can enjoy peak - valley electricity price revenue



Electricity distribution in remote areas



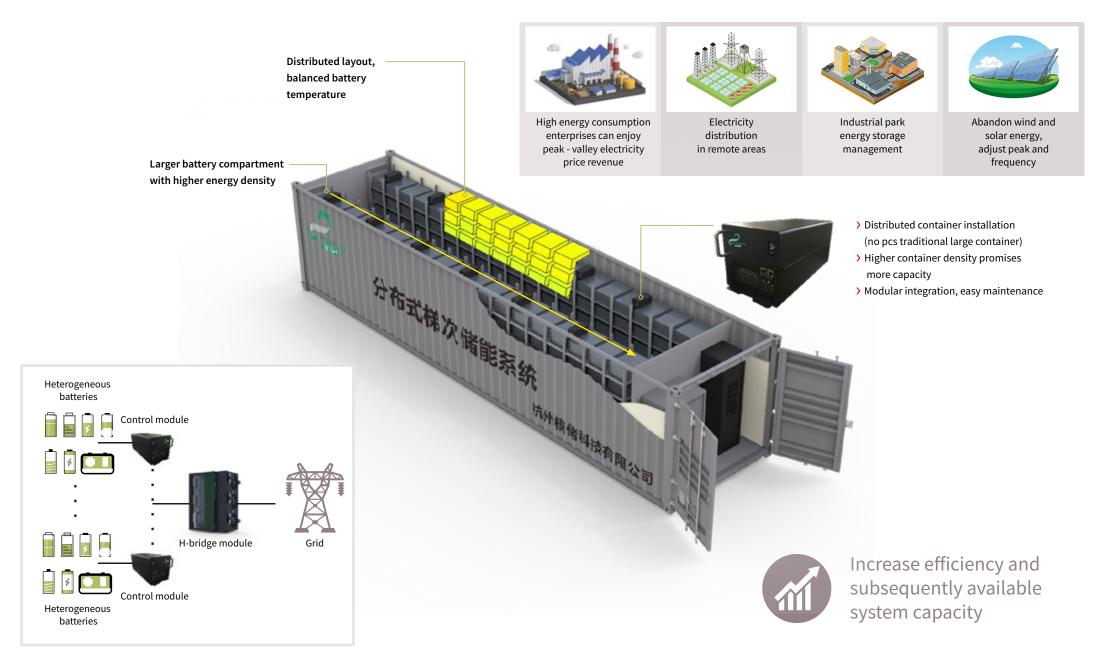
Industrial park energy storage management



杭州模储科技有限公司

Abandon wind and solar energy, adjust peak and frequency

Energy distributed storage container system



MOBIUS solution with OptiMOS[™] MOSFET

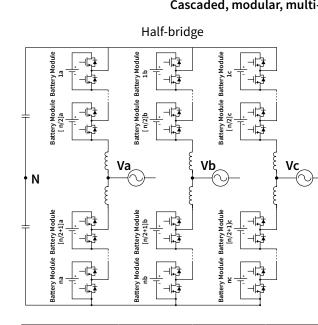
	Rated power (kw)	100	
AC-side parameters	AC connection mode	Three-phase and four-wire (A, B, C, PE)	
	Working mode	Continuous working	
	Maximum DC power (kW)	4.2 (at rated power)	
DC-side parameters	DC bus maximum voltage (V)	80	
	DC voltage operating range (V)	36-80 (Rated voltage Ue = 380 V _{AC} , voltage range 0.85-1.2 Ue less)	
	DC voltage ripple coefficient (%)	5	
	Rated grid voltage (V)	AC 380 (U _N)	
Grid charging and discharging	Allowable grid voltage (V)	0.85~1.2 U _N	
and discharging parameters	Rated grid frequency (Hz)	50	
	Allowable grid frequency (Hz)	49-51	
	Total current harmonic distortion rate (%)	3 (at rated power)	
	Power factor	≥ 0.98	
System parameters	Charge-discharge conversion time (ms)	≤ 100 ms	
	Efficiency (%)	97	
	Allowable ambient temperature (°C)	-20°C ~ 45°C	
	Protection grade	IP20 indoor	
	Cooling mode	Forced air cooling	

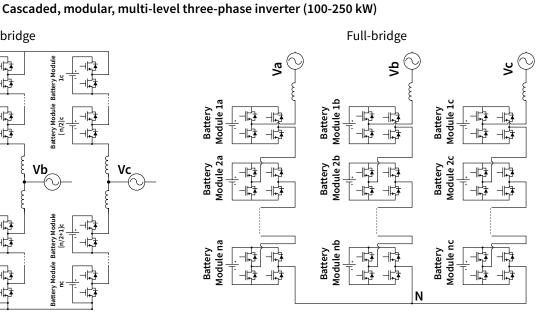
	Rated power (kw)	200	
	AC connection mode	Three-phase and four-wire (A, B, C, PE)	
AC-side parameters	Working mode	Continuous working	
	Maximum DC power (kw)	13.5 (at rated power)	
Control module parameters	DC voltage operating range (V) 92-129 (rated voltage Ue = 380 V _{AC} , voltage range 0.85-1.Ue less)		
	DC voltage ripple coefficient (%)	5	
	Rated grid voltage (V)	AC380 (U _N)	
	Allowable grid voltage (V)	0.85~1.2 U _N	
Grid charging	Rated grid frequency (Hz)	50	
and discharging	Allowable grid frequency (Hz)	49-51	
parameters	Total current harmonic distortion rate (%)	3 (at rated power)	
	Power factor	≥ 0.98	
	Charge-discharge conversion time (ms)	≤ 100ms	
Cabinet parameters	Protection grade	Ip20 (indoor)	
- cabinet parameters	Cooling mode	Forced air cooling	
System parameters	Efficiency (%)	97	
System parameters	Allowable ambient	-20°C ~ 45°C	



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Product solutions for multi modular multilevel systems





	Product type	Battery module voltage [V]	MOSFET break-down voltage [V]	R _{DS(on)} max. [mΩ]	Product name	Packaging	Recommended part number
	MOSFET	48	80	0.7	OptiMOS™ 5	TOLL	IPT012N08N5
		60	100	1.5	OptiMOS™ 5	TOLL	IPT015N10N5
		> 60	150	4.8	OptiMOS™ 5	D ² PAK	IPB048N15N5
	Driver IC	n/a	n/a	n/a	EiceDRIVER™ dual-channel, functional, isolated	Various available	2EDF7275F

Find more relevant products on www.infineon.com/optimos

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Infineon OptiMOS[™] MOSFET is the fundamental component of the inverter system due to its

- > Superior performance with market lowest R_{DS(on)}
- > Greatest thermal performace due to

outstanding cooling properties

> Highest product releabilty



