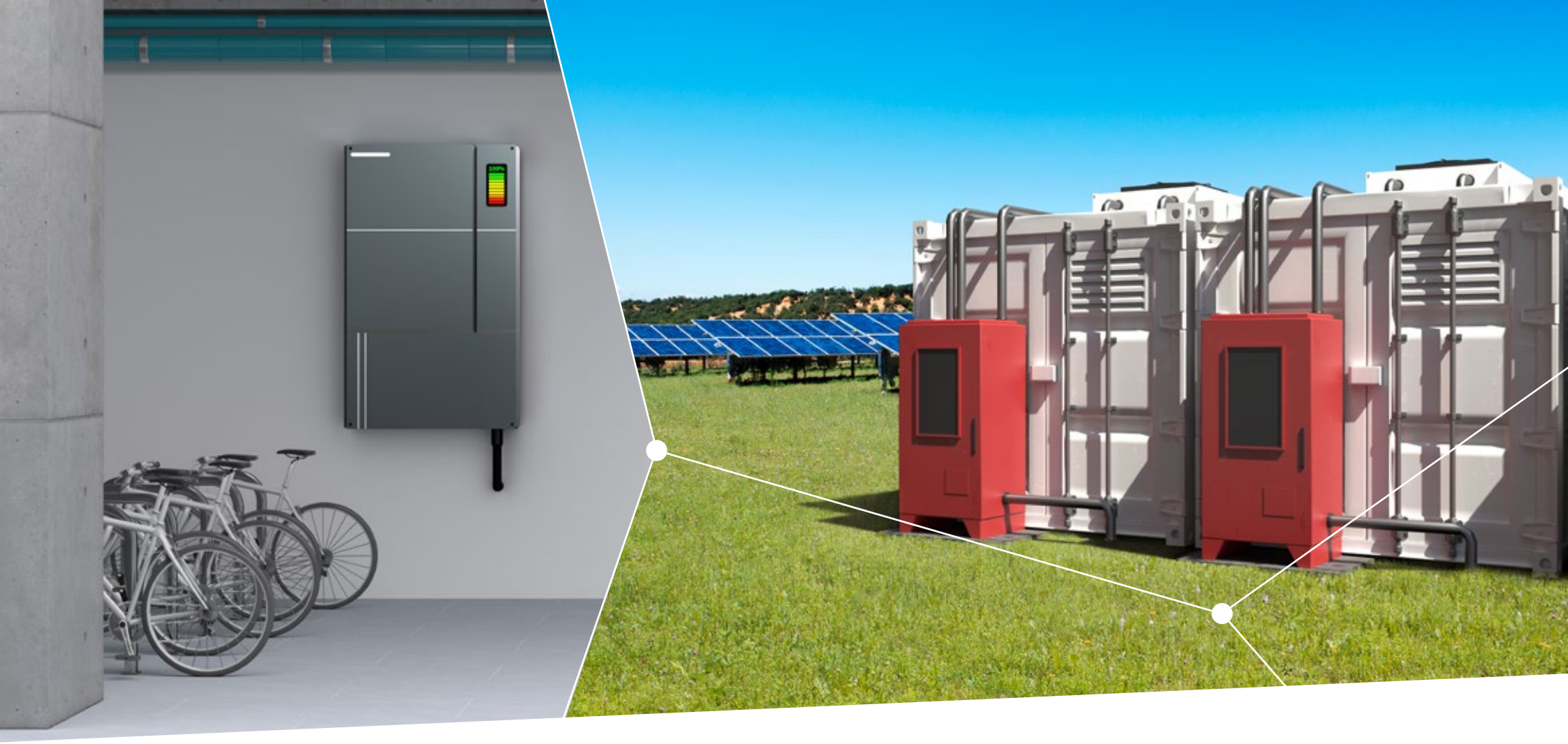


Your benefit are our partners

Associated partner guide

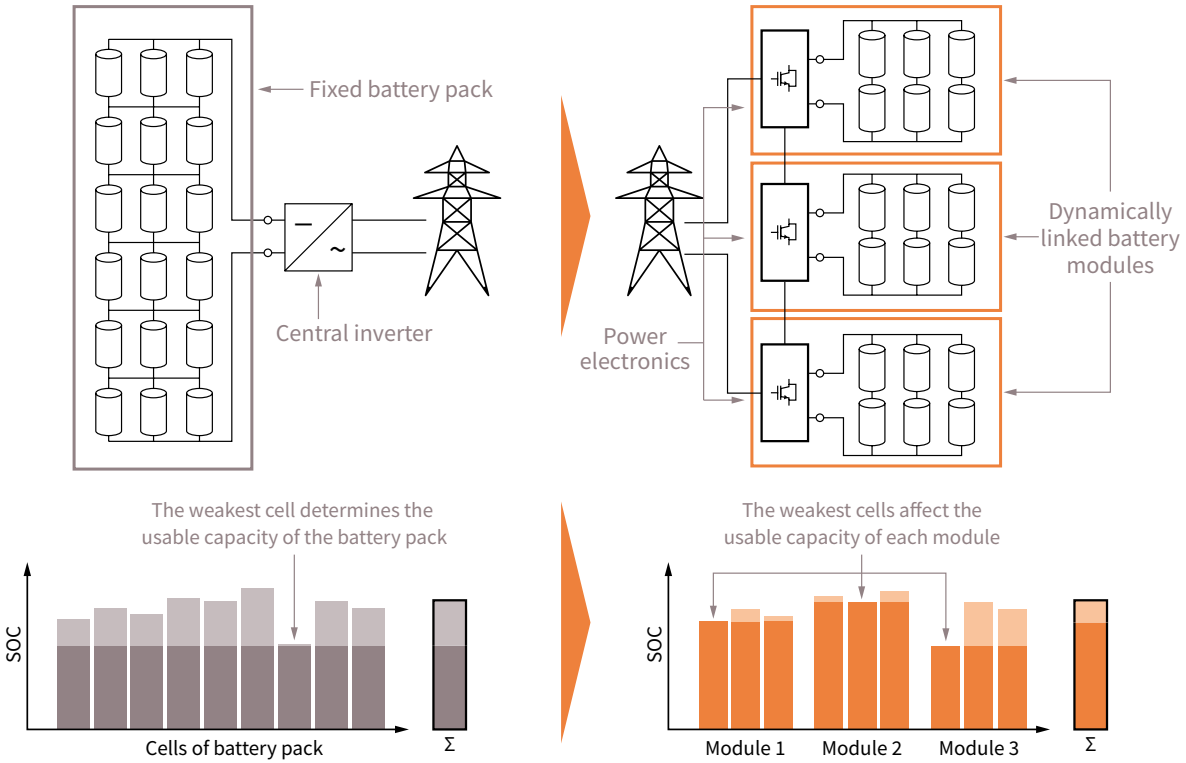
www.infineon.com/energy-storage-systems

Trust in Infineon and our partner

Reduce your time-to-market and boost your company's success with Infineon's partner solutions around the globe.

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

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
- 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

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"

www.infineon.com/energy-storage-systems

Store more energy with a decentralized power conversation

Energy storage container system

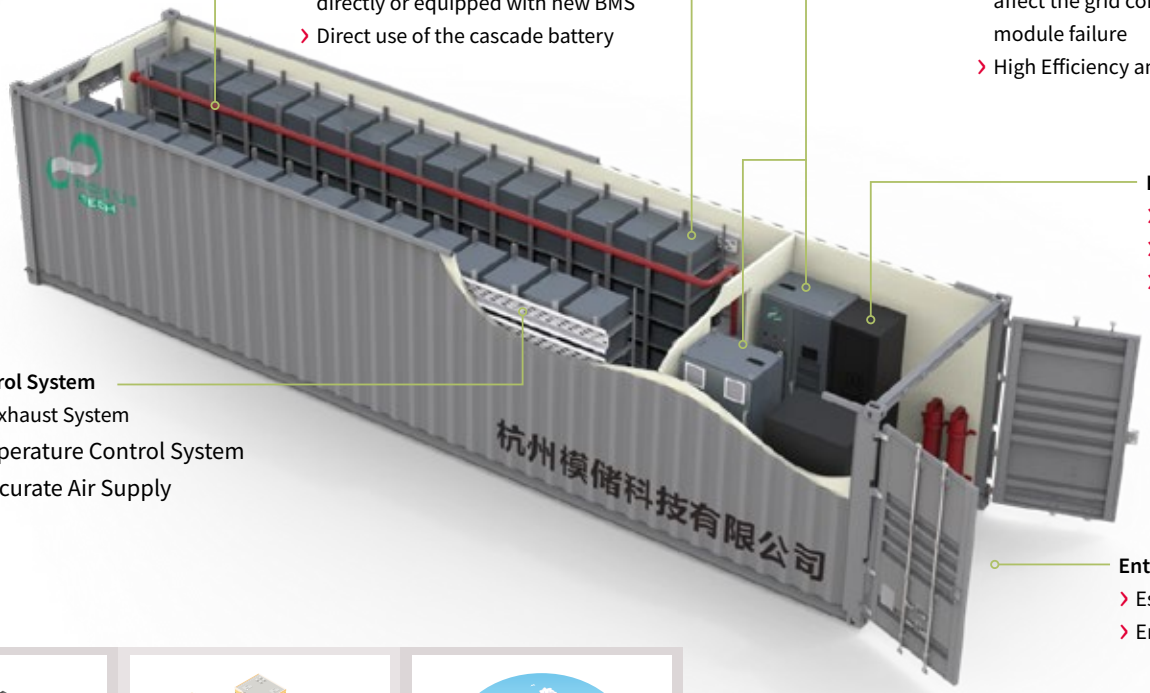
Gas fire protection system
- Gas, temperature, smoke, flame sensor
- Intelligent warning, leakage warning
- Real-time analysis, intelligent judgment

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

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

Lighting System
- General Lighting
- Emergency Lighting

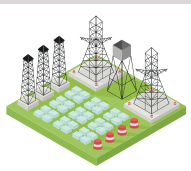


EMS Management System
- Data Acquisition/Data Communication
- Data Analysis/Data Storage
- Status Monitoring/Operation Analysis

Temperature Control System
- Ventilation and Exhaust System
- Automatic Temperature Control System
- Duct Design, Accurate Air Supply

Entrance Guard System
- Escape Door
- Emergency Release System

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



Electricity distribution in remote areas

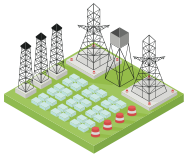
Industrial park energy storage management

Abandon wind and solar energy, adjust peak and frequency

Increase efficiency and subsequently available system capacity

Energy distributed storage container system

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



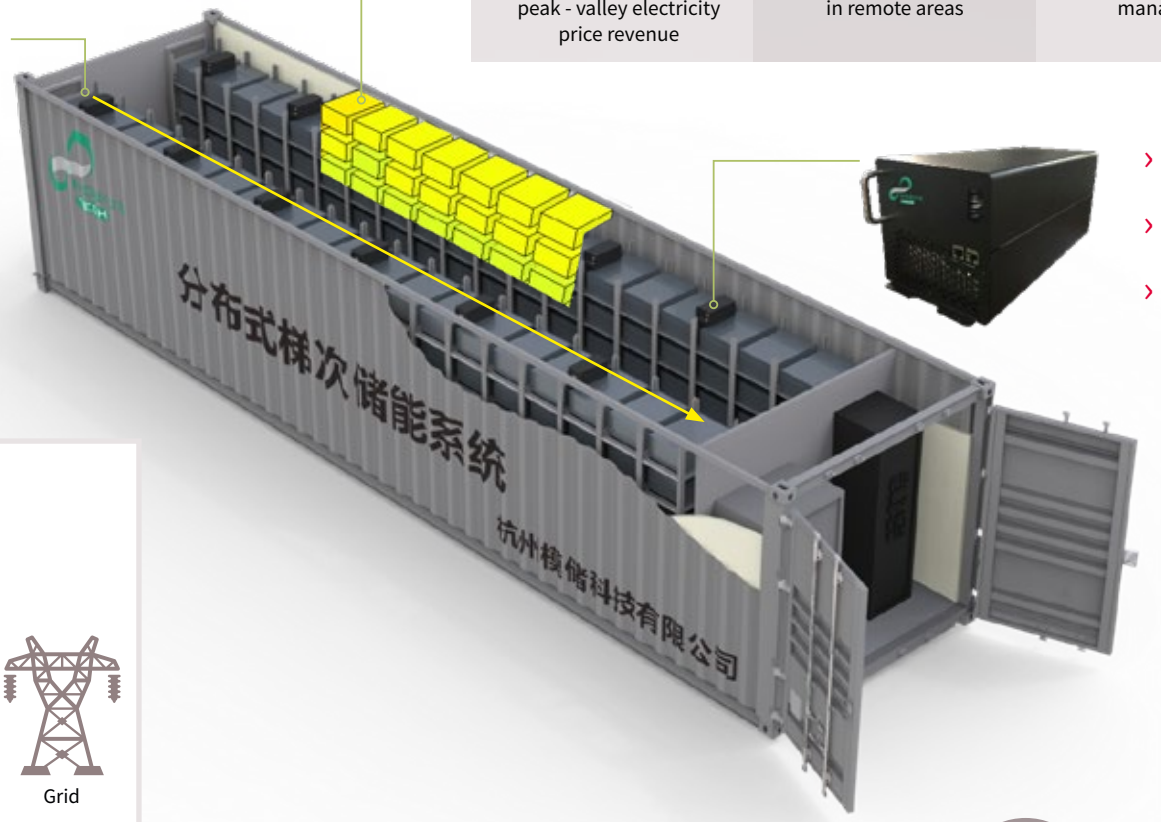
Electricity distribution in remote areas

Industrial park energy storage management

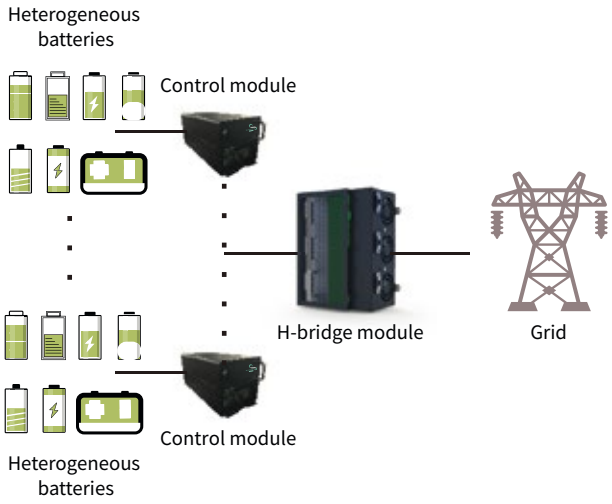
Abandon wind and solar energy, adjust peak and frequency

Distributed layout, balanced battery temperature

Larger battery compartment with higher energy density



- Distributed container installation (no pcs traditional large container)
- Higher container density promises more capacity
- Modular integration, easy maintenance



Increase efficiency and subsequently available system capacity

MOBIUS solution with OptiMOS™ MOSFET

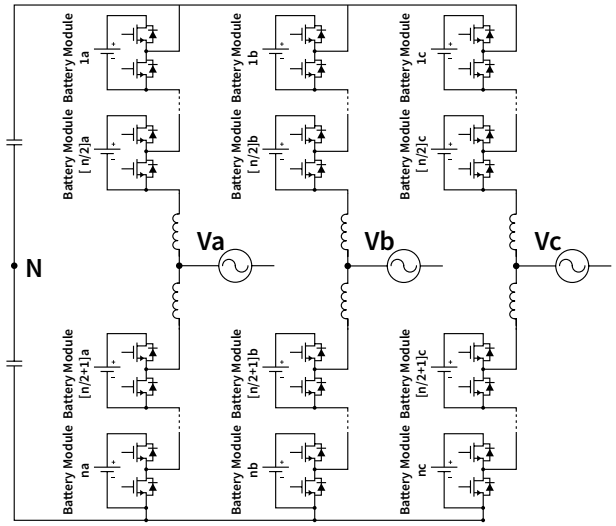
AC-side parameters	**Rated power (kw)**	100
	AC connection mode	Three-phase and four-wire (A, B, C, PE)
	Working mode	Continuous working
DC-side parameters	**Maximum DC power (kW)**	4.2 (at rated power)
	DC bus maximum voltage (V)	80
	DC voltage operating range (V)	36-80 (Rated voltage Ue = 380 V_{AC}, voltage range 0.85-1.2 Ue less)
Grid charging and discharging parameters	**DC voltage ripple coefficient (%)**	5
	Rated grid voltage (V)	AC 380 (U_N)
	Allowable grid voltage (V)	0.85~1.2 U_N
	Rated grid frequency (Hz)	50
	Allowable grid frequency (Hz)	49-51
	Total current harmonic distortion rate (%)	3 (at rated power)
System parameters	**Power factor**	≥ 0.98
	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

AC-side parameters	**Rated power (kw)**	200
	AC connection mode	Three-phase and four-wire (A, B, C, PE)
	Working mode	Continuous working
Control module parameters	**Maximum DC power (kw)**	13.5 (at rated power)
	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
Grid charging and discharging parameters	**Rated grid voltage (V)**	AC380 (U_N)
	Allowable grid voltage (V)	0.85~1.2 U_N
	Rated grid frequency (Hz)	50
	Allowable grid frequency (Hz)	49-51
	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)
	Cooling mode	Forced air cooling
System parameters	**Efficiency (%)**	97
	Allowable ambient	-20°C ~ 45°C

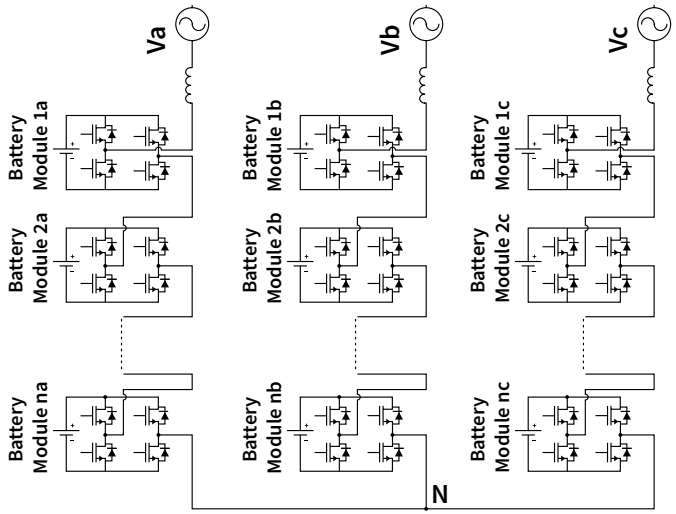
Product solutions for multi modular multilevel systems

Cascaded, modular, multi-level three-phase inverter (100-250 kW)

Half-bridge



Full-bridge

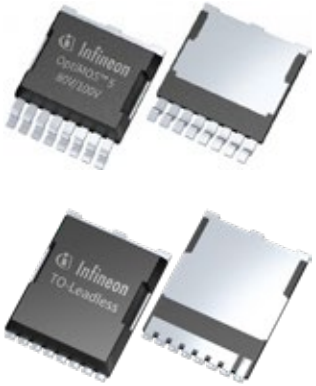


Product type	Battery module voltage [V]	MOSFET break-down voltage [V]	$R_{DS(on)}$ max. [mΩ]	Product name	Packaging	Recommended part number
MOSFET	48	80	0.7	OptiMOS™ 5	TOLL	IPT012N08N5
	60	100	1.5	OptiMOS™ 5	TOLL	IPT015N10N5
	> 60	150	4.8	OptiMOS™ 5	D^2PAK	IPB048N15N5
Driver IC	n/a	n/a	n/a	EiceDRIVER™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

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

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**



www.infineon.com

Published by
Infineon Technologies Austria AG, 9500 Villach, Austria

Document number: B118-I1010-V1-7600-EU-EC
Date: 04/2020