**(LG Energy Solution** 

# The Beginning of Commercial Vehicle Innovation

LG Energy Solution's Automotive Batteries for Commercial Vehicles



LG Energy Solution Website : www.lgensol.com



Contents are subject to change without prior notice. July 2022



### A Firm Global Leader in EV Batteries

Batteries are at the core of deciding EV performance. As a firm global leader in the battery sector, LG Energy Solution will initiate a new era in electric commercial vehicles.

#### Pioneer of EV Battery Industry

LG Energy Solution's challenge to become the best in the world continues with stellar accomplishments in the EV market, such as delivering the world's first automobile battery in 2009 and developing the world's first NCMA high-capacity battery in 2021.



LG Energy Solution has carried out 79 xEV projects from 24 global automobile manufacturers, expanding its portfolio from cell to pack, and other various solutions.



#### LG Energy Solution's xEV Battery Adoption ('09~'20)

Since 2009, a total of 443M LG Energy Solution cells have been adopted to more than 4,505K xEVs.



#### Partnerships with Top Automobile Manufacturers



### State-of-the-Art Lithium-ion **Batteries**

From materials to design, processing, and quality management, LG Energy Solution's accumulated expertise innovates all battery production stages to deliver the most robust batteries.

Innovative Processing Technology

LG Energy Solution's technologies guarantee

performance and guality by maximizing

battery density, efficiency, and safety.

# **Highly Optimized**

Why LG Energy Solution

The most ideal battery solutions for commercial vehicles are provided by LG Energy Solution based on its world-renowned technology and knowhows.

### Ultra Power NCMA Cell

High-tech materials like 'NCMA cathode' and 'silicon anode' enable longer driving distances, faster charging, and longer product life.



※ 1) CNT : Carbon Nanotube

**Higher Safety** 

### Flexible Pouch Cell Design

Pouch cell design secures high energy density with longer battery life and customizable designs.









Improved Space Utilization

Cost-efficient at the Module Level

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Safety Reinforced

Separator (SRS)

maintain high battery quality.

Rigorous safety technologies, such as SRS and

BMS, prevent thermal risks or fire hazards and



Battery Management System (BMS)

### **Proven Reliability**

**Vehicles** 

• Proven reliability and safety across electric vehicles sold worldwide.

**Solutions for** 

Commercial

 Extensive internal verification processes prevent risks related to product performance, reliability, and traceability.



### Saving Time and Costs

• Pre-developed products dramatically reduce time and costs.



### **Customizable Total EV Battery Solution**

- Capable of developing and mass-producing new products with tailored specifications.
- Offers a total solution from cell to module, including BMS.
- \* Standard BMS : Universal application to all products expected by 2024.



### **Comprehensive Product Line-ups**

With LG Energy Solution's proven cell and module line-ups which are widely accepted in the EV market, flexible applications that cater to customers' different needs are feasible.



### **Cell Specifications**

Cells

Category			Power Cell	Energy Cell				
	Model		P41	E65D	E61V	E78		
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Performance	Capacity (Min, 25℃, 0.3C)	Ah	40.8	64.5	60.0	78.0		
	Nominal Voltage	Vdc	3.63	3.66	3.68	3.67		
	Energy	Wh	148	236	220	286		
	Energy Density (Min)	Wh/L	486	444	532	602		
		Wh/kg	226	234	253	265		
	Max Charge Current (A)	Pulse Charge * (10sec, SoC 50%, 25°C, BOL)	380	300	200	184		
	Max Discharge Current (A)	Continuous Discharge (25℃, BOL)	204	130	180	234		
		Pulse Discharge * (10sec, SoC 50%, 25°C, BOL)	380	400	400	496		
	Max Discharge Power (W)	10sec, SoC 50%, 25℃	1241	1260	1289	1463		
	Internal Resistance (mΩ)	10sec, SoC 50%, 25℃	1.28	1.20	1.15	1.48		
	Power to Energy Ratio	W(Power: 10sec, SoC 50%, 25°C) /Energy	8.3	5.3	5.8	5.1		
	Quick Charge		SoC 80% @30-40min, 25-35°C					
Warranty			80% Capacity retention @8years, passenger car condition					
Dimension		L*W*T(mm)	266.5*139*8.22	290.5*159*11.5	354*101.05*11.52	548*100*8.65		
Weight		g	663	1017	887	1083		
Operating Temperature (°C)			-30 ~ 55					
Storage Temperature (°C)			-30 ~ 60					
Mass Production			Poland('21~)	Korea('21~)	Poland('18~)	Poland('19~)		

\* Remark : It is the max current value at a certain OEM's system level, not the value at the cell itself.

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### **Comprehensive Product Line-ups**

With LG Energy Solution's proven cell and module line-ups which are widely accepted in the EV market, flexible applications that cater to customers' different needs are feasible.

#### Module Solutions for Maximizing EV Space Efficiency

Compact battery volume allows for flexible height and width variations resulting in diverse module combinations, helping with more innovative EV designs.



• Compact & Slim Size



Customizable
Structure



 Higher Cooling Efficiency

# Modules



#### Module Specifications

Category			Short Module		Long Module		Low Height Module		
Model			P28.5 1P12S	E66C 3P4S	E78 2P12S	E78 3P8S	E60 2P12S	E60 3P8S	
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Configuration			1P 12S	3P 4S	2P 12S	3P 8S	2P 12S	3P 8S	
Performance	Capacity	Ah	30.3	196.2	156	234	118.6	177.9	
	Nominal Voltage	Vdc	43.2	14.68	44.04	29.36	44.04	29.36	
	Operating Voltage Range	Vdc	30-49	12-17	36-51	24-34	30-51	20-34	
	Energy (Min)	kWh	1.30	2.88	6.87	6.87	5.22	5.22	
	Energy Density (Min)	Wh/L	223	453	487	487	460	460	
		Wh/kg	144	213	222	222	226	226	
	Max Charge Power (kW)	10sec, SoC 50%, 25℃, BOL	9.6	5.1	16.3	16.3	19.0	19.0	
	Max Discharge Power (kW)	10sec, SoC 50%, 25℃, BOL	8.2	12.8	34.7	34.7	25.0	25.0	
	Quick Charge		SoC 80% @30-45min, 25-35°C						
Dimension		L*W*T (mm)	385.6*86*175.7	390*151.6*107.5	590*225*108		580*233*84		
Weight		kg	9.0	13.5	31.0		23.0		
Operating Temperature (°C)			-30 ~ 55						
Storage Temperature (°C)			-30 ~ 60						
Warranty			80% Capacity retention @8years, passenger car condition						
Mass Production			Poland('20~)	Poland/China('20~)	Polanc	l('21~)	Poland('21~)		

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## Reliable Production and Supply

**Unmatched Global Production Capacity** 

quality control to secure a reliable battery supply.

on major continents. This global system streamlines local production and

LG Energy Solution boasts the highest global production capacity with multiple facilities

Stable raw material supply and regional production capabilities are becoming more critical than ever. LG Energy Solution maintains a global multi-base production capacity that secures steady regional production and a flexible supply chain.

#### **Extensive Global Supply Chain Network**

With worldwide raw material and component partners, LG Energy Solution maintains a stable supply chain for high-performance battery production.

#### Strong Global Supply Chain

