

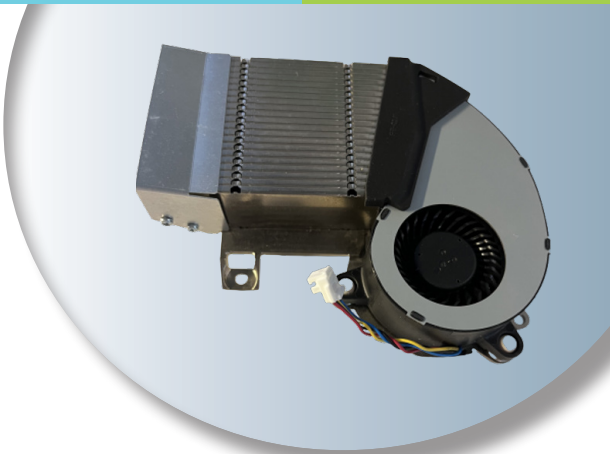


Powering the Future of Automotive Innovation

High Power Magnetic Solutions for xEV

Active Soldering Heat Sink

- **Efficient Thermal Design** – Aluminum zipper fins and precision die-casting with multiple pedestals maximize heat dissipation across varied sources.
- **Reliable Build Quality** – Robust soldering process ensures durability and compliance with strict cleanliness standards.
- **Quiet, Optimized Performance** – Special blower design minimizes vibration and noise while delivering stable airflow.



Description	Infotainment Fan Cooling Module
Dimensions (mm)	108 × 102 × 28
Weight (kg)	0.12
Voltage (vdc)	5
Current (A)	0.27
Input Power (W)	1.35
Speed (rpm)	4650
Noise (dB-A)	39
Airflow (cfm)	7.51
Air Pressure (in H2O)	0.468
Operating Temp. (°C)	-20 ~ 90



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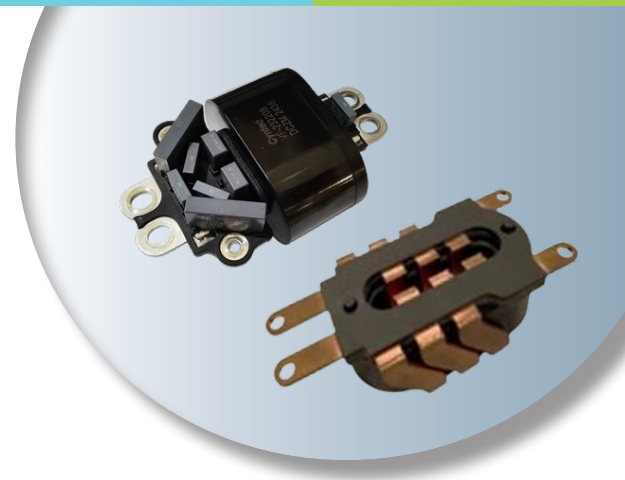
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Powering the Future of Automotive Innovation

DC Filters

- Available for 400V and 800V platforms
- 8-18% core usage reduction over competitor
- Insert molded for size and weight savings
- Laser welded for multi-turn capability
- Available with integrated X/Y cap
- Linear and U-shape multi-stage construction



ZCM @ 1MHz Ω		80		1135	
Turns		N=1	N=3	N=1	N=3
Size	Cu vol. (cm ³)	1.71	11.3	9.4	28.17
	Core vol. (cm ³)	16.26	3.25	230.34	46.2
	Module Size (mm ³)	79,497	89,326	439,708	330,411
				25% Module Size Reduced	



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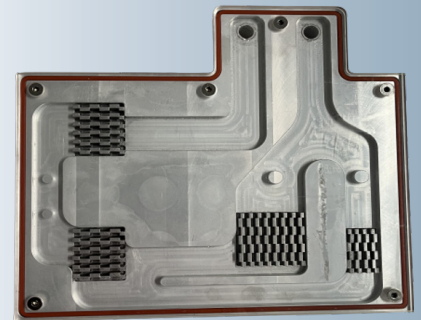
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ADAS Liquid Cooling Plate

- **Easy Assembly & Installation** – Designed for quick integration and hassle-free setup.
- **Multi-Source Heat Dissipation** – Multiple bosses support adhesion of various heat sources for efficient thermal management.
- **Optimized Micro-Fin Structure** – Enhanced internal fin design



Description	Cold Plate for ADAS ECU System
Dimensions (mm)	200 × 180 × 35
Weight (kg)	1.0
Material	Aluminum
Thermal Design Power (W)	300
Liquid Flowrate (LPM)	1
Flow Impedance (KPa)	2
Operating Temp. (°C)	-40 ~ 85



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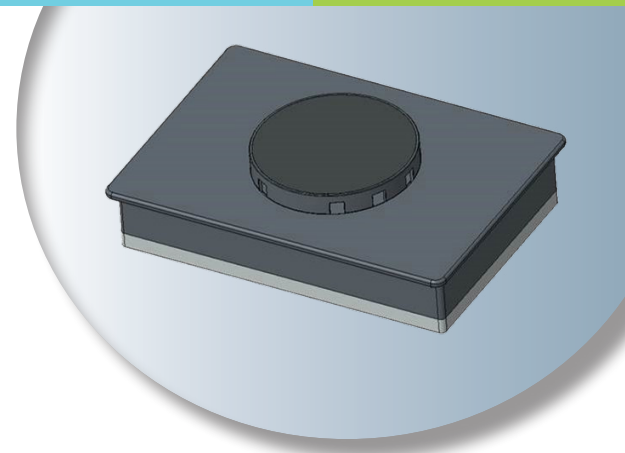
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Wireless Charger

- Compliance with Qi v2.1 MPP 15W
- Support EPP (up to 15W) and PPDE charging
- Support CAN interface, FOD, card protection
- OVP/OCP/OTP function
- Dimension = 136mm x 95mm x 41.5mm



System	
Operating Temperature with charging (°C)	-40 ~ 60
Storage Temperature (°C)	-40 ~ 90
Operating Frequency (kHz)	360
Qi Compliance	v2.1
Weight (g)	< 350
Enclosures	IP5K2

Input Specs	
Input Voltage (V)	9 ~ 16
Standby Power (W)	2
Input Operating Current (A)	3
Output Specs	
Charging Efficiency	> 75%
No. of Devices	1 pc.
Max Power of Rx (W)	15



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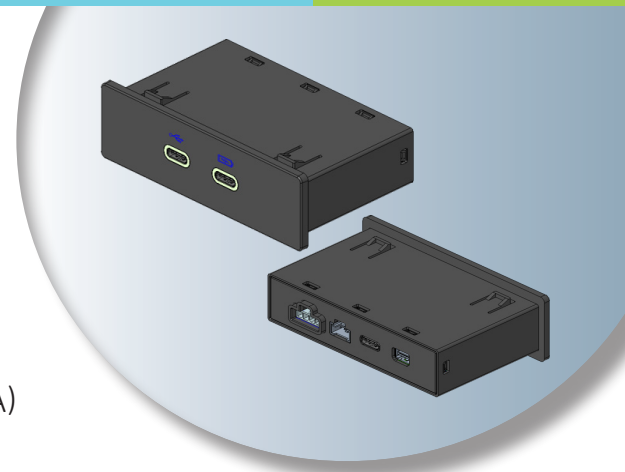
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In-Vehicle USB-C Charger

- PD 100W dual port, 12Vin
- Total max. charging power: 100W
 - » Single Port (C1 or C2) = 100W (20V/5A)
 - » Dual Port (C1+C2) = 50W (20V/2.5A) + 50W (20V/2.5A)
- Support charging + data transmission + video streaming
- Dimension = 85.2mm x 50.4mm x 21.0mm



System	
Operating Temperature with charging (°C)	-40 ~ 85
USB PD Spec	PD 3.2
USB Spec	USB 3.2 Gen 1x1
Display Port	1.4
Weight (g)	< 90

Input Specs	
Input Voltage (V)	9 ~ 16
Standby Power (W)	0.19
Input Operating Current (A)	9.6
Output Specs	
Output Voltage (V)	5, 9, 15, 20
Charging Efficiency (%)	95



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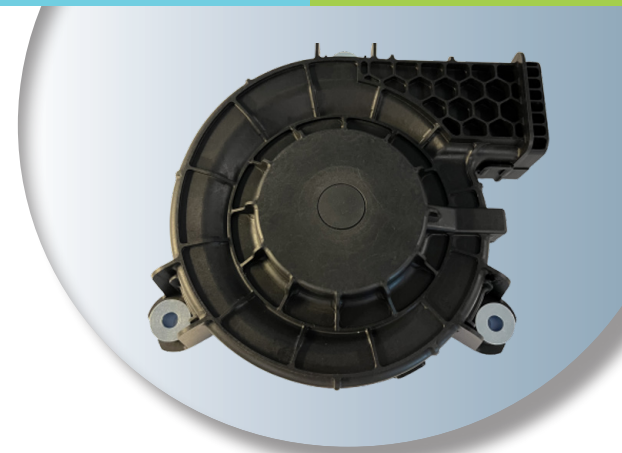
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Powering the Future of Automotive Innovation

BMS Blower - 16cm & 20cm

- **High Performance & Low Noise** – Optimized for efficient operation with minimal sound.
- **Wide Operating Temperature** – -40°C to 85°C for reliable performance in extreme conditions.
- **Low Quiescent Current** – Only 100 μ A for energy-efficient standby.
- **Protection & Compliance** – Over-temperature protection, IP69K ingress resistance, ISO16750 salty spray tested, and OEM EMC compliant.



Description	BMS Blower
Dimensions (mm)	147 × 153 × 115
Weight (kg)	0.58
Voltage (vdc)	13
Current (A)	7.2
Input Power (W)	93.6
Speed (rpm)	3200
Noise (dB-A)	65
Airflow (cfm)	157.1
Air Pressure (in H ₂ O)	2.59
Operating Temp. (°C)	-40 ~ 85



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Powering the Future of Automotive Innovation

HVAC Blower DC 12V Motor

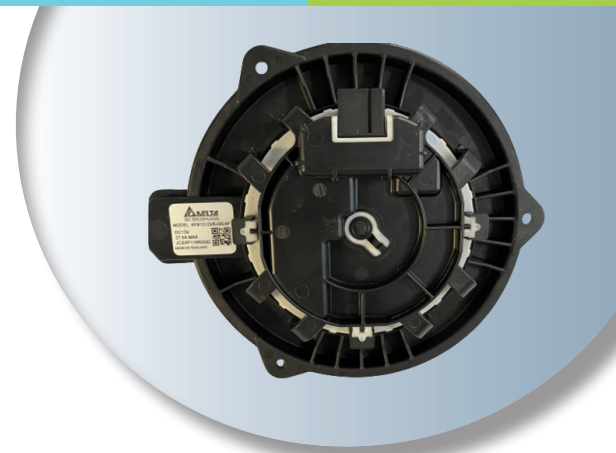
- **Sensorless Control** – Seamless, intelligent operation without extra sensors.
- **Modular Packaging Design** – Flexible, compact, and easy to integrate.
- **Exceptional NVH & EMC Performance** – Quiet, smooth, and interference-free.
- **High Efficiency & Enhanced Torque** – More power, less energy—delivering superior performance.



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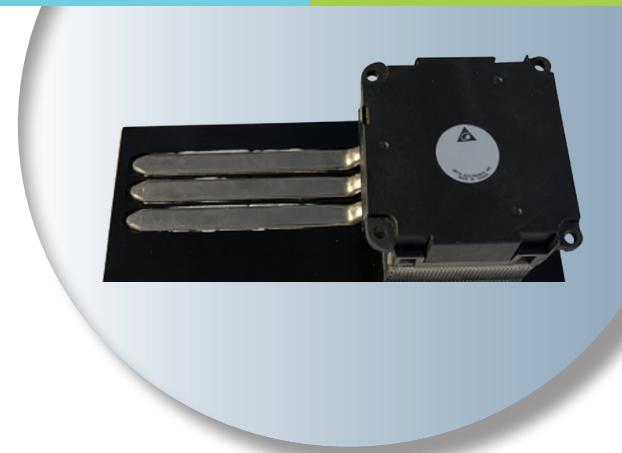
Description	Blower Motor
Rated Voltage (VDC)	12
Operating Voltage (VDC)	9 ~ 16
Operating Temp. (°C)	-40 ~ +85
Configuration	BLDC motor 12 slot / 10 pole
Rotation Direction	CCW & CW
Weight (g)	795
Torque (N-m)	0.60
Control Interface	PWM/LIN
Connectors	Customizable



Powering the Future of Automotive Innovation

LIDAR Cooling Module

- **Advanced Cooling Fan** – Specially designed blower for optimized airflow.
- **High Power Dissipation** – Efficiently handles up to 70W with copper stacked fins, aluminum base, and three embedded heat pipes.
- **Forced Convection** – Ensures superior cooling performance for LIDAR systems
- **Durable Construction** – Aluminum base with black anodization, heat pipes, and nickel-plated copper fins for enhanced anti-corrosion protection.



Description	LIDAR Cooling Module
Dimensions (mm)	155 × 67 × 43
Weight (kg)	0.29
Material	Aluminum, Copper
Thermal Design Power (W)	70W
Fan Type	Blower
Speed (rpm)	6650
Noise (dB-A)	52.9
Airflow (cfm)	12.33
Operating Temp. (°C)	-20 ~ 95



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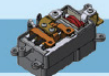
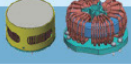
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High Power Magnetic Solutions for xEV

	OBC	HV-LV DC/DC	48V-12V DC/DC	PCU Boost DC/DC	HV Inverter & 48V Inverter	BMS & E Compressor / PTC Heater
High-power Transformers	 OBC up to 22 kW	 2 in 1 Xfmr	 DCDC up to 5kW			
Low-power Transformers for Gate Drive	 1 to 1 ~ 1 to 6 winding					 Auxiliary power / Isolated signal
High Current Chokes		 200A-300A	 non-coupled / coupled	 30kW~50kW		
PFC Chokes	 Ring-core/ Assembly/ Molding					
EMC Components CMC / DMC	 Ring-core/ Assembly/ Molding		 Assembly-type	 Assembly-type	 CMC	 DMC
					 Busbar DC/AC Filter	



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Battery Cell

- **Stacking Structure** – Delivers long cycle life, reduces separator stress, and enhances long-term reliability.
- **Prismatic Format** – Provides a high-density cell layout for efficient pack integration.
- **Laser-Welded Seal** – Minimizes leak risk and ensures lasting durability.
- **Rigid Enclosure** – Offers mechanical toughness, greater electrolyte reserve, and extended reliability.
- **Robust Internal Design** – Lowers short-circuit risk, protects electrodes with insulation, and secures stack integration.



Description	
Nominal Voltage	3.7 V (NCM Chemistry)
Capacity	60 Ah @ 0.2 C-rate
Nominal Energy	222 Wh
Energy Density	153 Wh/kg 339 Wh/L
Max. Charge Current	Continuous 114A @ 25°C Instant_285A, less than 10 sec.
Max. Discharge Current	Continuous 545A (9.5C) Cut-off voltage: 2.7
Internal Resistance	AC IR less than 0.6mΩ
Dimensions (mm)	110.1 W x 38.2 (D) x 155.6 (H)
Weight	1.4 kg ±100 g
Operating Temp.	Charge: 0°C to 55 °C Discharge: -20°C to 80°C



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Powering the Future of Innovation

PEC Battery Cell

- **Structure** – Supports both winding and stacking cell structures to ensure long cycle life and high reliability.
- **High Energy Density** – Advanced powder-packing technology reduces porosity and minimizes filler breakage, maintaining high capacity density within a given form factor.
- **Customization** – Ability to customize cells or assembly/pack systems to meet specific customer requirements.
- **Chemistry Roadmap** – Ongoing annual chemistry improvements that increase energy density by a targeted percentage each year.

Description	BPBZ522635-717
Nominal Capacity	739 mAh
Rated Capacity	717 mAh
Nominal Voltage	3.91 V
Max. Charging Voltage	4.5 V
Discharge End Voltage	3.0 V
Internal Resistance	ACIR $\leq$ 100m Ω



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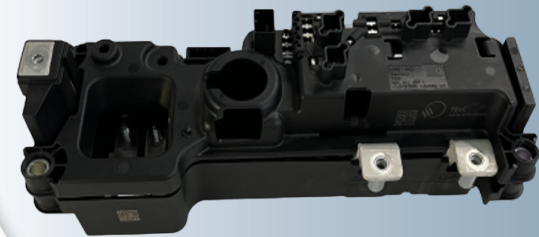
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Powering the Future of Automotive Innovation

Battery Disconnect Unit Housing

- Design integration, prototype and testing
- High-precision stamping
- Overmolding and isolation barrier
- System component assembly
- High-current, formed, busbar solution
- USMCA-compliant manufacturing



Components	Plastic Material	Flammability Resistance	Copper Busbar Cu-ETP R240	Surface Plating
E-Box + Inlay *	PA66-GF35-FR Black	TL1010-A V0	3mm	Sn 3-6µm & Ni 1-3µm
Connector (HV max and CM100)	PA6-FR Orange		4mm	Cu/Sn6 3-7µm
Connector (BMCs and xx80s)	PK-GF30-FR		5mm	Cu/Sn6 3-20µm

* Contact plate alloy: CuNi3SiMg t = 0,63mm surface: Sn 3-6µm & Ni 1-3µm



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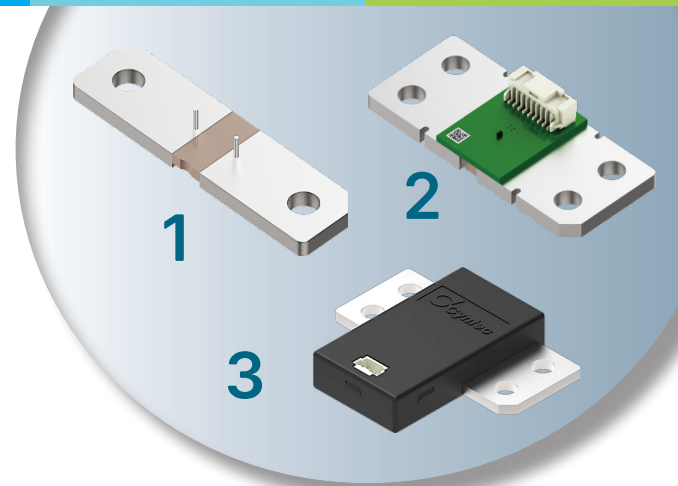
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Shunt Module

- Safety in battery design.
- Digital signal output via SPI or CAN interface.
- High accuracy level $\leq \pm 0.1\%$ by temperature compensation.
- Provide custom design service, but not temperature calibration data provided.



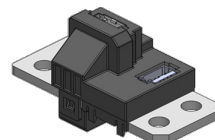
	Type 1 Shunt	Type 2 Shunt Module	Type 3 Shunt Module
R-drift after RA	0.3%	0.3%	0.3%
R25 deviation	+/- 5%	< +/- 0.3% (with DM code)	+/- 0.1%
TCR variation	depends on system	with DM code info	done
Current calibration	depends on system	depends on system	done
System accuracy	depends on system	depends on system	+/- 0.4% (Life accuracy)
Functional safety	NA	2 NTC, 2 Vsense depends on system	ASIL-C ASIL-D (development)



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U-Core Dual Hall Shunt
Sensor Module



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Power Choke

- Wide size range
- Ultra-low loss
- High power density
- Ideal for MCU, battery controller & gateways application
- Compact lineup: 1.6 × 0.8 mm - 17 × 17 mm

Common Mode Choke

- Lead-frame type design
- Supports CAN-FC & Ethernet
- OA compliant, OEM approved
- Perfect for CAN/CAN-FD/Ethernet application
- Compact lineup 3.22 × 2.5 mm - 4.5 × 3.2 mm



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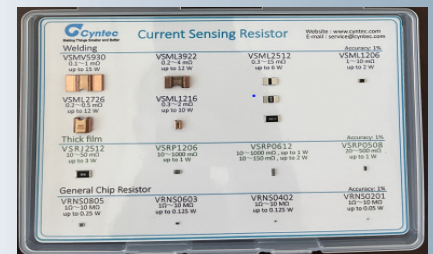
Description	Power Choke
VCTA2016 Series (mm)	2.2 × 1.8 × 1.2
Inductance Range (uH)	0.1 ~ 10
Rated Current (A)	9.0 ~ 0.6
Max. Operating Temp. (°C)	165

Description	Power Choke
VCUW064E Series (mm)	7.3 × 6.8 × 4.5
Inductance Range (uH)	0.22 ~ 100
Rated Current (A)	22.0 ~ 1.5
Max. Operating Temp. (°C)	155

Powering the Future of Automotive Innovation

Automotive-Grade CSR's

- Up to 15W high power output
- Ultra-low ESL <1nH for stable high-frequency performance
- Low TRC <50 ppm/°C for thermal reliability
- Excellent heat dissipation under heavy loads
- Four-terminal precision design
- Low EMC/EMI layout for cleaner signal integrity



Type	Part #	Resistance (Ω)	Power (W)	Accuracy
Welding	VSMV5930	0.1 ~ 1	up to 15W	1%
	VSML3922	0.2 ~ 4	up to 12W	
	VSML2512	0.3 ~ 15	up to 6W	
	VSML1206	1 ~ 10	up to 2W	
	VSML2726	0.2 ~ 0.5	up to 12W	
	VSML1216	0.3 ~ 2	up to 10W	
Thick Film	VSRJ2512	10 ~ 50	up to 3W	
	VSRP1206	10 ~ 1000	up to 1W	
	VSRP0612	10 ~ 1000 10 ~ 150	up to 1 W up to 2W	
	VSRP0508	20 ~ 500	up to 1W	
General Chip Resistor	VRNS0805	1 ~ 10	up to 0.25W	
	VRNS0603	1 ~ 10	up to 0.125W	
	VRNS0402	1 ~ 10	up to 0.125W	
	VRNS0201	1 ~ 10	up to 0.05W	



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