Automotive Systems

Voice/Data and Public Safety Communications Antenna
Remote Engine Start and Wireless Heating Antenna
ADAS (Advanced Driver Assistance System)
  - Adaptive Lighting and Cruise Control
  - Automatic Braking
  - Active Vibration Control
  - Lane Departure
  - Parking System
  - Navigation System
  - Driver Alertness Monitor
  - Blindspot Detection
  - Antennas, Power Inductors, Ethernet, Common Mode Chokes
Automotive Ethernet Common Mode Chokes
Light & Vision Systems Power Inductor
Instrument Cluster Inductors
Infotainment
  - Power Transformers, Inductors, Ethernet Chokes, PoDL Chokes, CMC and Antennas
Wireless Charging Antennas
Remote Keyless Entry Antenna
Dedicated Short-Range Communications Antenna
Security Systems
  - Heads-Up Display
  - Windshield Wiper Control
  - Airbag Deployment
  - Night Vision
  - Accident Recorder
  - Auto-Dimming Mirror
  - Cabin Noise Suppression
  - OBDII
  - Inductors, Common Mode Chokes, Ethernet, Antenna
Electronic Drive Systems
  - Power Steering
  - Transmission
  - Fuel Pump
  - Throttle Control
  - Valve Timing
  - Active Yaw Control and Suspension
  - Antennas, Inductors, CM Chokes
Engine Control Unit Common Mode Chokes
Safety Systems
  - Anti-Theft GPS/3G/NFC and Lock Sensor Antenna
Instrument Cluster Inductors
Remote Engine Start and Wireless Heating Antenna
Wireless Charging Antennas
Voice/Data and Public Safety Communications Antenna
Remote Keyless Entry Antenna
Dedicated Short-Range Communications Antenna
Security Systems
  - Heads-Up Display
  - Windshield Wiper Control
  - Airbag Deployment
  - Night Vision
  - Accident Recorder
  - Auto-Dimming Mirror
  - Cabin Noise Suppression
  - OBDII
  - Inductors, Common Mode Chokes, Ethernet, Antenna
In large battery pack applications with daisy chain connections, the number of cells connected in series is very high, and the large voltage differences demand component-to-component isolation. The serial communication links between boards needs to be isolated by transformer coupling circuits instead of capacitor coupling.

Pulse Electronics offers a full line of products for safety isolation, noise suppression and communications. Including high voltage isolation transformers, BMS transformers, common mode chokes, ethernet magnetics as well as wireless antenna options.

Solutions for isolated flyback, push-pull and h-bridge available.

Battery Management System (BMS)
The On-Board Charger (OBC) is a sophisticated high voltage power supply that converts the AC power from the charging source to the DC voltage required to charge battery packs in an EV or HEV vehicle. Efficiency of the system is critical to minimize charging times and ensuring operation within thermal limits. The power magnetics within the system are a combination of off-the-shelf standard magnetics and highly engineered customized solutions to maximize performance.
The high-power DC-DC converter is used to change the high-voltage (200-800Vdc) from the battery pack to the lower voltage (12v-48v) that is used to power the automotive sub-systems. As in the OBC, efficiency of the system is critical to ensure maximum battery utilization. Isolation within the DC-DC converter is also critical to ensure that sensitive low voltage systems are not damaged and to ensure user accessible systems are safe. Pulse designs and manufactures a wide range of lower power catalog components (current sensing and isolation transformers) and high-power customized components (DCDC transformer and output inductor).
The inverter uses high power IGBTs or switches to change the high dc voltage battery pack energy into an AC signal to drive and control the AC motor. Through regenerative braking the inverter can also use the braking energy to charge the battery pack. The inverter is critical to vehicle operation and handles significant amounts of power (Up to 100kW) and it is necessary to isolate multiple high voltage nodes to ensure safe operation. Pulse designs and manufactures UL approved isolation transformers as well as the magnetics used in the auxiliary power supply and signal I/O.
From kbps to Gbps, signal magnetics for In-Vehicle Networking

- Data Control Module
- ADAS
- Lidar
- Radar
- GPS
- Infotainment Head Unit
- Cameras

RF / EMC / EMI
- Multi-Layer wire wound
- Ceramic/Ferrite Wire wound
- EMI Beads

Common Mode Chokes
- Automotive Ethernet
  - 100/1000BaseT1/dual-speed
  - PoDL up to 470mA
  - 10BaseT1S

Common Mode Chokes
- FlexRay, LIN, CAN
- CAN-FD
- A2B

Ethernet transformers
- 100BaseT
- 1000BaseT
- 10GBaseT
Pulse – Network PBU for Automotive

EMI Beads
- PE-XXXXAFB:XXXX Series
- 0603, 0850 sizes
- 30 Ω to 2000 Ω

Ceramic/Ferrite Wire Wound
- PE-XXXXCD/FT Series
- 0402, 0603, 0850, 1008 sizes
- 1.0 to 68,000 µH

Transformers for Monitoring Applications
- HM/U200hNL, HM3xxH/2/NL
- Functional, Basic and Reinforced Insulation
- Multiple package sizes and functionality
- IEC62369 / IEC60964

High Isolation Signal Transformers
- Custom Solutions
  - Unique header design and electrical characteristics
  - IC specific designs

RF/EMC/EMI Inductors

Network Products for Automotive

Ethernet Transformers

100BaseT
- HM50xxNL, HM60xxNL
- Multiple package sizes and ports
- SMD and PCMSA package

1000BaseT
- HM51xxNL, HM61xxNL
- Multiple package sizes and ports
- SMD and PCMSA package

10GBaseT
- HM71xxNL
- Multiple package sizes and ports

Custom Solutions
- Unique header design and electrical characteristics

Common Mode Chokes

General Purpose
- PE-1210ACXXXXSTS, 1210 size, -50°C to 150°C, IEC6228-3 Class 3 / C1A 110
- PE-1810ACxxxxSTS, 1812 size, -40°C to 125°C, IEC6228-3 Class 2
- 11uH, 22uH, 51uH, 100uH

Automotive Ethernet
- AE2002 (1812 size, 100BaseT1, IEEE802.3bw)
- AE5002 (1812 size, 1000BaseT1, IEEE802.3bw)
- AE0100 (1210 size, 100BaseT1, IEEE802.3bw & Open Alliance TCI)
- AE1210 (1210 size, 1000BaseT1, IEEE802.3bw & Open Alliance TCI)
- AE1003 (2512 size, PoDL 100BaseT1, IEEE802.3bw)
Pulse – Power PBU Products

From mW to kW, Power Magnetics for Transportation

Power Inductors
- Power Bead Inductors (Up to 120Apk)
- Molded Powder Inductors (Up to 118Apk)
- Composite Core Inductors (Up to 38Apk)
- Shielded & Unshielded Drum (Up to 30Apk)
- Toroid Inductors (Up to 40Apk)
- High Power Inductors (Up to 220Apk)

Current Sense Magnetics
- Functional, Basic and Reinforced Insulation (Up to 4000Vrms Isolation)
- Multiple platforms from 4A to 38A

Common Mode Chokes
- Up to 38Ams
- Up to 2500 Vrms Isolation
- Multiple package sizes available

Isolation Transformers
- Functional, Basic and Reinforced Insulation (Up to 5000Vrms)
- Multiple turns ratios and volt-sec ratings
- Custom transformers available

Power Transformers
- Multiple Topologies
- Wirewound Transformers (2W to 1KW)
- Planar Transformers (30W to 3.3kW)
- High Isolation Transformers (up to 5kVrms)
- Custom transformers available

Surface Mount (SMT), Through-hole (THT) and Pin In Paste (PIP) Solutions
Pulse – Automotive PBU Products

Inverters, Circuit Breakers, Coils & More

**Power Supplies & Inverter**
- Power transformer, Chokes, CMC
- Specific inductive components (no Catalogue components)

**Circuit Breakers**
- MCB, MCCB, ACB, Rogowski coils, energy transformer, specific design system consisting of multiple coils

**Motor Coils & Assemblies**
- Segment coils for internal and external rotors & complete Stator / Rotor / Motor Assemblies

**Onboard Charger**
- Customer specific main transformers, PFC’s, Inductors, CMC’s, etc.

**Valve Actuators**
- Customer specific Valve Actuators

**Drives and Metering industry**
- Current transformers for devices incl. specific housings and design

**Solenoids**
- Solenoids, with and without armature specific design and tools

**Ignition Coils**
- High voltage ignition coils for burner applications

**Cable Systems**
- For Robotics, Construction machinery, Agricultural machinery, Rail vehicles, Communal vehicles

**Power Supplies**
- For Medical equipment, Smart Home, Sanitary, Industry
Antennas of Everything

Embedded
Ceramic, Helical, LDS, Composite, Stamped Metal and FluidANT antennas for effective miniaturization and simplicity.

IPD RF Components
Filters, Baluns, Couplers and Diplexers to minimize noise and attenuation.

Internal (FPC/PCB/NFC/WPC)
Pre-optimized performance with common plastic housing. Compact dimensions and adhesive mount. Thin NFC antennas for payment and sharing.

External/In-Building
Reliable blade/stick antennas for routers and cutting-edge design and performance proven DAS antennas for in-building wireless and public safety.

Vehicular
Diverse line of outdoor automotive antennas. Ruggedized, tamper-proof and aesthetically pleasing.

Outdoor
Weather proof portable and fixed outdoor antennas for portable radio and data collecting purposes.

Cables, Connectors and Mounts
Support NMO and various mounting types with custom cable types and connector selections.

Engineering and Manufacturing Capabilities
R&D, LDS Manufacturing, Customized RF Design, RF Testing, PTCRB/Approval Testing, Tuning and Matching