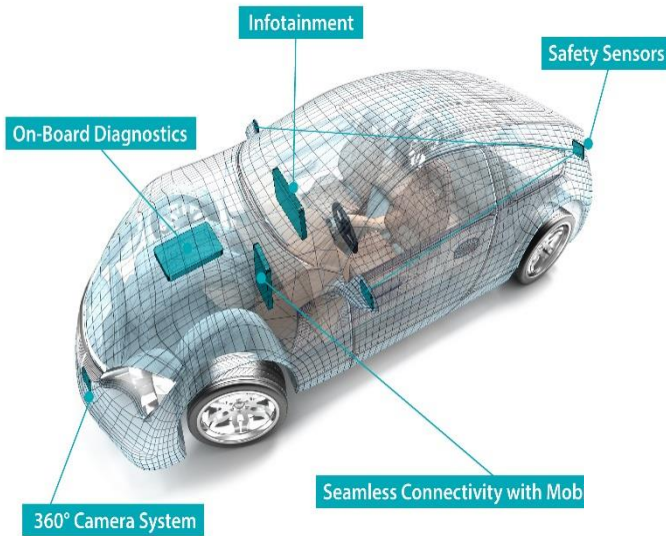




Automotive Communications

Pulse Electronics offers full Line of AEC-Q200 qualified 100BASE-TX/T1 and 1000BASE-TX/T1 Ethernet Magnetics and Common Mode Chokes for Automotive Communication Applications

Pulse products support multiple technology's used in the Automobile including MOST, CAN Bus, FlexRay, Ethernet Audio Video Bridging (AVB), 100Base-T1, 1000Base-T1, and Power over Data Lines (PoDL). Pulse's parts are designed to operate from -40C up to +125C, have high reliability, high volume manufacturing, long term manufacturing support, and meet AEC-Q200 requirements.



Applications:

Infotainment, Advanced Driver Assist Systems (ADAS) Body Control, Camera/Radar, Battery Management, Backbone Diagnostics

Technologies Supported:

MOST, CAN bus, FlexRay, Ethernet AVB, 100Base-T1, 1000Base-T1, PoDL

Features and Benefits:

- Designed to meet 100BASE-TX/T1 and 1000BASE-TX/T1 IEEE802.3 standards
- Supports all major PHY manufacturers
- Multiple packages and configurations available
- Meets AEC-Q200 requirements
- TS-16949 certification for 100Base-T1, 1000Base-T1, and PoDL parts in-process
- Designed to operate from -40C up to +125C
- PPAP Level 3 Capable

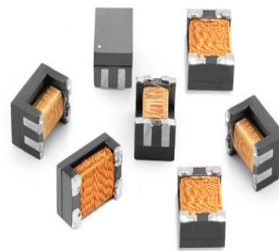
Featured Products (In production):

- | | |
|-------------------------|-------------------------|
| • HM0068ANL, HM1188NL | Fast Ethernet/AVB |
| • HM1234FNL | Fast Ethernet Quad Port |
| • HM1225NL | MOST 50/150 |
| • HM5004EFNL, HM5149NL | Gigabit - 1000BASE-T |
| • HM6098FNL (PoE+) | Gigabit - 1000BASE-T |
| • TM8116NL | CAN Bus - CMC |
| • PE-0805/1206CCMC | CAN Bus/FlexRay/LVDS |
| • PE-1812AAC series CMC | CAN Bus/FlexRay |

SINGLE TWISTED PAIR TECHNOLOGY (In development)

- AE2002* 100BASE-T1 CMC
- AE3003 100BT PoDL CMC
- AE5002 1000Base-T1 CMC

*Qualified, production release Q3 2016



AE-Series CMC



HM-Series Ethernet Transformers

Competing Technology/Standards in Cars

Technology	Speed	PHY Cross Ref.	Main Applications	Pulse Parts
CAN Bus: (Controller Area Network)	~1Mbps	N/A	-Powertrain -Chassis -Body Electronics	Common Mode Chokes (CMC): -PE-0805CCMC Series -PE-1206CCMC Series -PE-1812AAC Series -TM8116NL
LIN: (Local Interconnect Network)	20kbps	N/A	-Body Electronics	N/A
FlexRay:	10Mbps	N/A	-Powertrain -Safety	Common Mode Chokes (CMC): -PE-0805CCMC Series -PE-1206CCMC Series -PE-1812AAC Series
MOST: (Media Oriented Systems Transport)	25Mbps 50Mbps 150Mbps	Microchip/SMCS -OS81082 -OS81092	-Cameras -Video	Ethernet Transformers: -HM1225NL
LVDS: (Low voltage differential signaling)	3Gbps	N/A	-Camera -Video	Common Mode Chokes (CMC): -PE-0805CCMC Series -PE-1206CCMC Series
Ethernet AVB: (Audio Video Bridging)	100Mbps 1000Mbps	Microchip/SMCS -LAN89303, LAN88730 Microchip/Micrel -KSZ8041/51xNL, KSZ9031RNXU/V, KSZ8864/73/95xMLLU Marvell -88E1119R, 88E1510	-Audio -Video Dashboard Display	Ethernet Transformers: -HM1188NL -HM0068ANL -HM1234FNL -HM5004EFNL -HM5149NL -HM6098FNL
Reduced Twisted Pair Ethernet: (100Base-T1, PoDL, 1000Base-T1)	100Mbps 1000Mbps	-Broadcom BCM89810 -NXP TJA1100 -Marvel 88Q2112	-Camera & ADAS -Sensors -All Comms. Networks	CMC and Inductors: -AE2002 – 100Mbps CMC -*AE3003 – PoDL CMC -*AE5002 – 1000Mbps CMC *Parts are in development