

NXP OABR* Automotive Ethernet PHY TJA1100

True Automotive PHY for reliable, cost-effective & space-optimized in-vehicle Ethernet

Implementing BroadR-Reach™ technology for transferring 100 Mbps over a single unshielded twisted pair [UTP] cable, the TJA1100 is optimized for automotive use cases and housed in a compact HVQFN36 (6 x 6 mm²) package.

KEY FEATURES

- ▶ Automotive-qualified PHY
 - Temperature range: -40 to +125 °C
 - Capacitive coupling to a single UTP cable (up to 15 m)
 - MDI pins protected against ±6 kV ESD (HBM, IEC61000-4-2) and transient pulses (ISO7637)
 - Low RF emission due to enhanced on-chip PAM-3 pulse shaping
 - MII and RMII with EMC-optimized output driver strength
 - Integrated 1.8 V LDO regulator allowing a single 3.3 V supply
 - Compact HVQFN36 package with wettable flanks
 - AEC-Q100 compliant device
- ▶ Extensive diagnostics and fail-safe behavior
 - Over-temperature protection
 - Detects cabling errors (shorts and opens)
 - Gap-free supply under-voltage detection with fail-silent behavior
 - Internal, external and remote loopback mode
 - Dedicated EN pin for emergency shutdowns
 - Link diagnosis with LED control output

- ▶ Enhanced low-power management
 - Low-power sleep mode offers less than 50µA power consumption
 - Local wake-up support
 - Robust remote wakeup via Ethernet wires
 - INH switch controls ECU supply
 - Power consumption optimized through configurable transmitter pulse amplitude adapted to cable length

APPLICATIONS

- ▶ IP-based camera links (for bird's-eye views)
- ▶ Advanced Driver Assistant Systems (ADAS)
- ▶ Backbone
- ▶ HD digital Infotainment systems

The TJA1100, an automotive Ethernet PHY that complies with the OPEN Alliance BroadR-Reach™ specification, transmits and receives up to 100 Mbps over a single unshielded twisted pair (UTP) cable of up to 15 m.

*OABR = OPEN Alliance BroadR-Reach

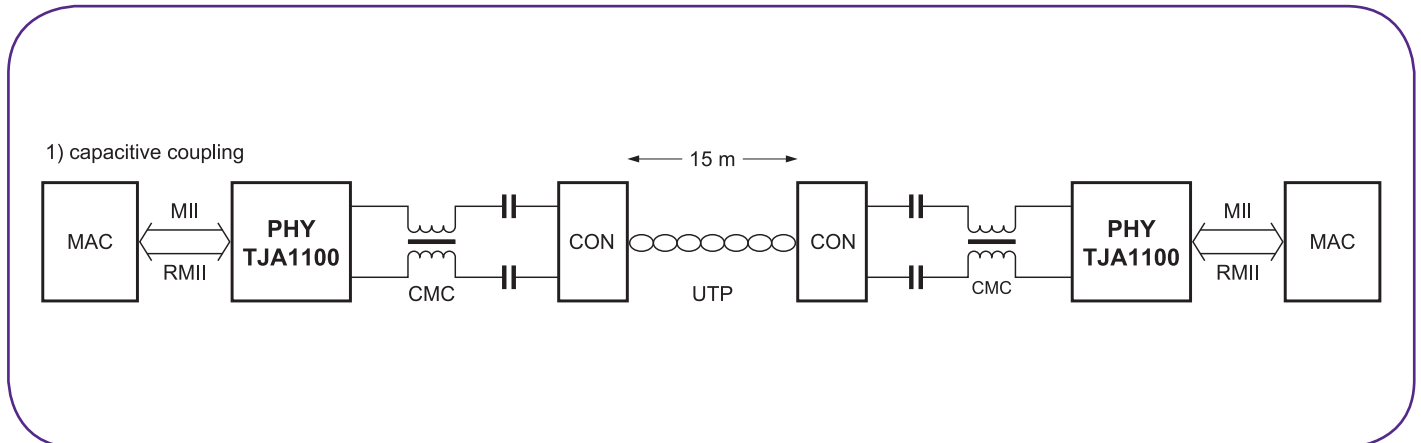


The device is optimized for capacitive coupling and can be adapted to different cable lengths. The integrated pulse shaping function significantly reduces the amount of external filter components. In addition, the TJA1100 provides user configurable functions for (R)MII output strength and MDI transmitter output amplitude that ensure minimal Electromagnetic Emission of the device.

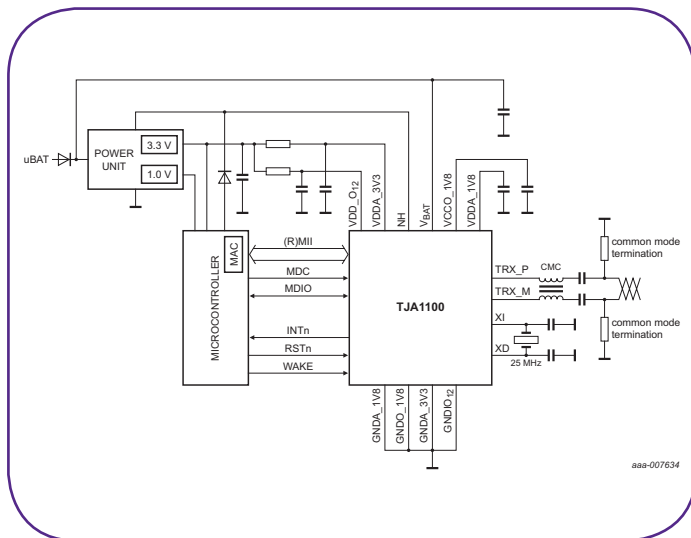
The power-supply architecture is optimized for all kinds of automotive use cases and keeps the power consumption at a low level.

The highly integrated TJA1100 represents a cost-optimized high-performance system solution for automotive Ethernet links and delivers true automotive performance.

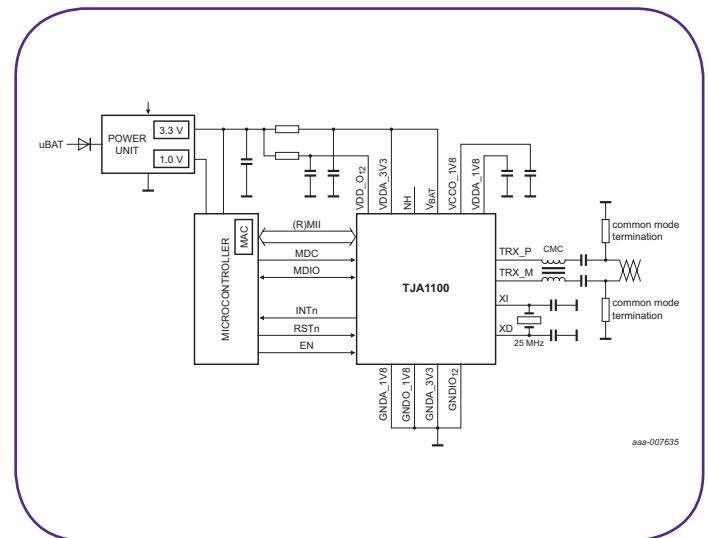
The TJA1100 provides the necessary robustness for automotive applications, without the need for external ESD filter components.



TJA1100 system diagrams for capacitive coupling



TJA1100 application circuit with support for remote wakeup



TJA1100 application circuit without support for remote wakeup

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