

Best-in-class
system efficiency

TJA1102 Dual PHY Automotive Ethernet Transceiver

TJA1102, the industry's first 100BASE-T1 compliant dual-port Ethernet PHY, enables superior system efficiency for high-speed networks. It offers 100 Mbit/s per port full duplex. This robust transceiver supports lightweight unshielded twisted pair (UTP) cables of up to 30 m in repeater mode for challenging automotive applications.

GENERAL FEATURES

- ▶ AEC-Q100 Grade 1 qualified
- ▶ Dual-port IEEE 802.3bw (100BASE-T1) PHY
- ▶ MII- and RMII-compliant interfaces
- ▶ HVQFN-56 pin package (8 x 8 mm²)
- ▶ Single-port operation possible
- ▶ Single-port product version TJA1102S available
- ▶ Receive and forward CLK signal
- ▶ Diagnosis of cabling errors (shorts and opens)

LOW-POWER MODE

- ▶ Sleep mode current: 45 μ A
- ▶ Dedicated PHY enable/disable input pin to minimize power consumption
- ▶ Inhibit-pin for voltage regulator control
- ▶ Single 3.3 V supply
 - External 1.8 V supply option

PARTIAL NETWORKING

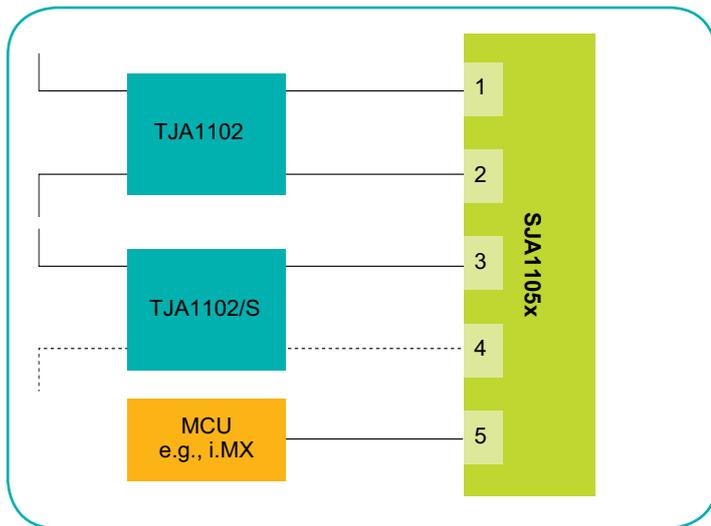
- ▶ OPEN-Alliance-TC10-compliant sleep-and-wake-up solution
 - Global system wake-up
 - Robust remote wake-up detection via bus lines
 - Wake-up forwarding on PHY level
 - Go-to-sleep hand shaking
 - Saves an additional wake-up line
- ▶ Local wake-up pin for wake-up line

AUTOMOTIVE APPLICATIONS

- ▶ Gateway
- ▶ IP camera links
- ▶ Driver assistance systems
- ▶ Infotainment

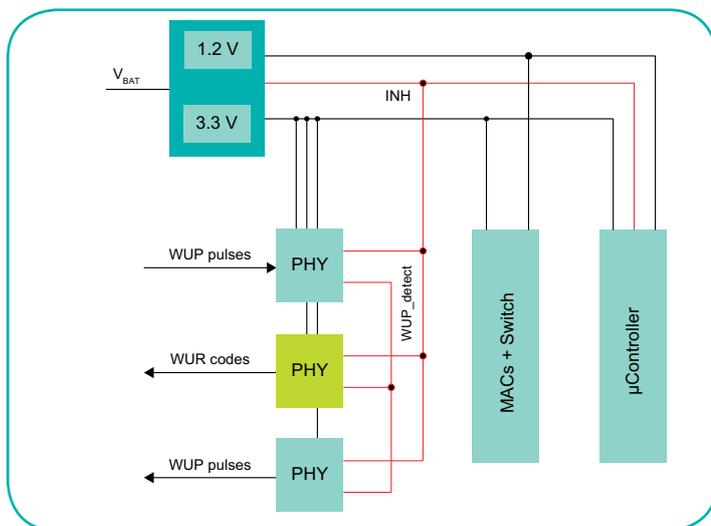


TJA1102/TJA1102S TRANSCIVER USE CASES



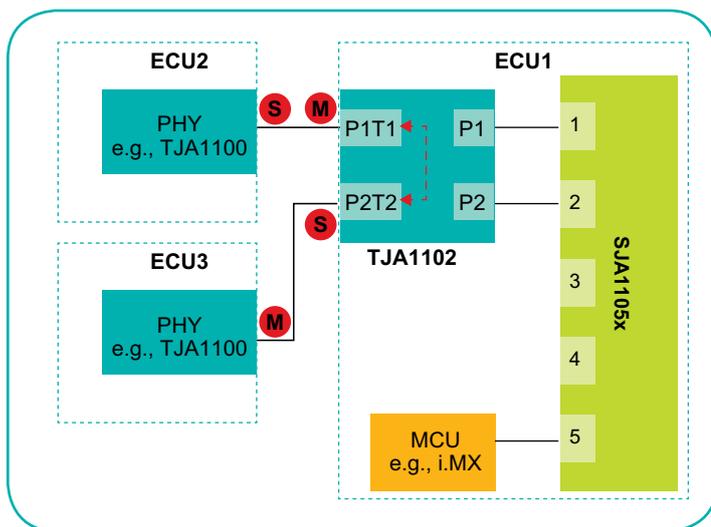
SMALLEST AREA AND HIGHEST FLEXIBILITY

- ▶ The TJA1102 transceiver has a pin-to-pin compatible single PHY variant, the TJA1102S, which gives the car OEM/Tier-1 the opportunity to scale up or down the port count without redesigning the PCB
- ▶ >30% area saving with TJA1102 compared to a 2x single port PHY solution



PARTIAL NETWORKING

- ▶ TJA1102 enables self-contained sleep and wake-up signaling over data line
- ▶ The wake-up forwarding function allows fast signal propagation without intervention of a switch, MAC or µC
- ▶ The wake-up can be forwarded via non-active links (blue PHYs in the figure) but also active links (green PHY in the figure)
- ▶ Saves an additional wake-up line



REPEATER MODE

- ▶ The TJA1102 transceiver supports internal reverse MII to operate the device in Repeater Mode
- ▶ Example applications:
 - ECU2 and ECU3 can quickly start to communicate ahead of MCU/switch boot up on ECU1
 - Fall-back mode for security purposes, bypassing the switch
 - Duplicate max cable length up to 30 m