For advanced AVB- and TSN-based in-vehicle networks

SJA1105P/Q/R/S Five-port Automotive Ethernet Switch Family

The SJA1105P/Q/R/S switch family targets automotive applications such as gateway, infotainment and ADAS fusion boxes with an array of configurable ports, advanced security features and a comprehensive, production-grade development ecosystem.

SJA1105PEL, SJA1105QEL, SJA1105REL, SJA1105SEL KEY FEATURES

The SJA1105P/Q/R/S switches comprise a 5-port automotive Ethernet switch family that supports IEEE® audio video bridging (AVB) and time-sensitive networking (TSN) standards.

Each of the five ports can be individually configured to operate at 10, 100 or 1000 Mbit/s to support PHY devices such as Fast Ethernet, Gigabit Ethernet or 100BASE-T1 PHYs like the NXP® TJA1100HN and TJA1102HN transceivers. The lack of integrated PHYs also allows the switch to operate as an inter-processor communication device between multiple processors and the DSPs on the same board.

GENERIC FEATURES

▸ Fully automotive AEC-Q100 qualified

▸ Automotive Grade 2 operation

▸ LFBGA-159 pin package (12 mm x 12 mm)

▸ Five ports capable of 10/100/1000 Mbit/s data rate

▸ Non-blocking full gigabit switching capability

▸ Support for AVB and TSN/802.1Qbv scheduled traffic standard

▸ MAC address filtering and listing security features

SECURITY AND ADVANCED FEATURES

▸ Whitelisting and blacklisting of MAC addresses via TCAM-based table

▸ Learning process with one-short learn option

▸ Support for double VLAN tag and frame replication and retagging

SOFTWARE AND TOOLS

▸ NXP production-grade AUTOSAR drivers

▸ NXP production-grade AVB software stack available for a range of NXP processors and controllers

▸ Evaluation board with standardized board connector for easy attach to NXP processor evaluation boards

▸ Development board with MPC57Gxx gateway processor

APPLICATIONS

▸ Gateway

▸ Clusters and head units

▸ ADAS fusion boxes

▸ Telematics and connectivity units

NXP SJA1105 ETHERNET SWITCH SERIES SELECTION TABLE

	Features	SJA1105	T	P	Q	R	S	Benefits
c and Interfaces	Operating temperature range: −40° C to +105° C (Automotive Grade 2)	●	●	●	●	●	●	Flexible ECU design • Support for any type of Ethernet PHY such as 100/1000BASE-T1 and 1000BASE-TX • Up to four cascaded switches controlled by a single host
	LFBGA159 12 x 12 mm2, 0,8 mm pitch	●	●	●	●	●	●	
	MII (3V3)/RMII (3V3)/RGMII (3V3) interfaces	●	●					
	MII/RMII/RGMII (all 1V8, 2V5, 3V3) interfaces			●	●	●	●	
	RGMII internal delay line			●	●	●	●	
	SGMII interface					●	●	
	Pin compatibility	●	●	●	●	○	○	
	Software compatibility	●	●	○	○	○	○	
Switching	Hash-based L2 look-up table	●	●					• Fine-grained control forwarding decisions in the network • Powerful debugging and diagnostic capabilities
	TCAM-based frame filtering			●	●	●	●	
	Double VLAN tagging support			●	●	●	●	
	RMON RFC 2819 Ethernet counters			●	●	●	●	
	VLAN-based egress tagging/ un-tagging	●	●	●	●	●	●	
	Frame mirroring and diagnostic features	●	●	●	●	●	●	
AVB/TSN	Credit-based shaping blocks for IEEE 802.1Qav	10	10	16	16	16	16	Key hardware features to enable the implementation of a fully synchronized network for: • Lip-synched playback of audio and video streams • Data-transmission scheduling for TSN networks
	IEEE 802.1AS time stamping support	●	●	●	●	●	●	
	TSN IEEE 802.1Qbv: time-aware shaping		●		●		●	
	TSN IEEE 802.1Qci* (pre-standard): per-stream policing		●		●		●	
Security	Ingress rate limiting on a per-port and per-priority basis for unicast/ multicast and broadcast traffic	●	●	●	●	●	●	Provisions for: • Authentication of the nodes connected to the network • Limiting the data generated by one or more connected devices
	Port reachability limitation and disabling address learning setting	●	●	●	●	●	●	
	MAC address whitelisting and blacklisting			●	●	●	●	
	Support for IEEE 802.1X-based authentication mechanism	●	●	●	●	●	●	
	Learn process with "one-shot "option			●	●	●	●	