

Drop-In Replacement Chips for TI TMS9914A Controller

NI NAT9914 Series

- Register and pin compatible with TI TMS9914A (40-pin DIP, 44-pin PLCC, and 44-pin QFP versions)
- Meets all IEEE 488.2 requirements
- Bus-line monitoring
- Preferred implementation of requesting service
- No messages sent when there are no Listeners
- 20 MHz maximum programmable clock rate
- Low-power CMOS design with TTL-compatible inputs
- Automatic EOS and/or NL message detection
- Handles DMA transfers
- Programmable data transfer rate with T1 delays of 350 ns, 500 ns, 1.1 μ s, and 2 μ s
- Programmably compatible with GPIB transceivers (TI, National Semiconductor, and Motorola)



Overview

The National Instruments NAT9914BPD, NAT9914BPL, and NAT9914BPQ are drop-in replacement parts for the Texas Instruments TMS9914A 40-pin DIP, 44-pin PLCC, and 44-pin QFP packages, respectively. The NI NAT9914 is 100 percent register and pin compatible with the 9914 on power-up and has additional features present in the NAT4882 IEEE 488.2 Controller chip. Thus, the NAT9914 can perform all interface functions defined by ANSI/IEEE Standard 488.1-1987 and meets the additional requirements and recommendations of ANSI/IEEE Standard 488.2-1992. The NAT9914 performs complete IEEE 488 Talker, Listener, and Controller functions. The NAT9914 has the complete register set and the identical pin configuration of the TI TMS9914A on power-up, but has complete IEEE 488.2 Controller functionality through software. You can take advantage of IEEE 488.2 with minimal software changes. Although the default clock input is 5 MHz, the NAT9914 can use clock input values up to 20 MHz for increased performance. The NAT9914 can also run in NEC 7210 register-compatible mode with a software command.

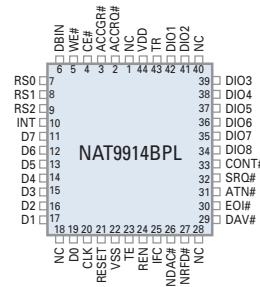


Figure 3. NAT9914BPL

If you are looking for alternatives to existing TI TMS9914A chip suppliers or planning to upgrade your designs to IEEE 488.2 without hardware changes, you should consider using the NAT9914. Furthermore, because the NAT9914 can accept faster clock inputs, performance increases without substantial firmware changes.

General Architecture

The NAT9914 manages the IEEE 488 bus. You can program the IEEE 488 bus by writing control words into the appropriate registers. CPU-readable status registers supply operational feedback. The NAT9914 mode determines the function of these registers. On power-up or reset, the NAT9914 registers resemble the TMS9914A register set, with additional registers that supply extra functionality and IEEE 488.2 compatibility. In this mode, the NAT9914 is completely pin-compatible with the TI TMS9914A. If you enable the 7210 mode, the registers resemble those of the NEC μ PD7210 set, with additional registers that supply extra functionality and IEEE 488.2 compatibility. This mode is not pin compatible with the NEC μ PD7210.

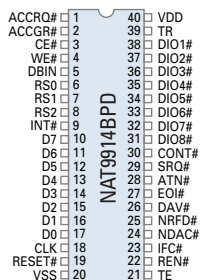


Figure 1. NAT9914BPD

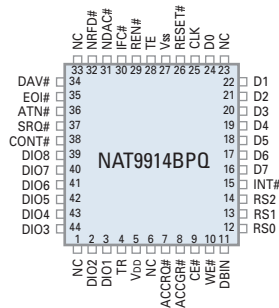


Figure 2. NAT9914BPQ

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RoHS Compliance

The NAT9914 is currently available from NI both in a standard package and as a RoHS-compliant chip. You can order the chips using the part numbers shown below. The RoHS-compliant parts are identified through the added "F" at the end of the part number and the chip itself is marked with an e3 inside an ellipse to indicate a pure tin lead finish in accordance with the marking recommendations defined in JEDEC JESD97. The RoHS-compliant NAT9914 ASICs have a matte pure tin finish on their leads.

The RoHS-compliant NAT9914 meets industry requirements for baking and maximum solder reflow temperature. The baking requirements are outlined in JEDEC J-STD-033, and NI recommends using the solder reflow profile as shown in IPC/JEDEC J-STD-020C with a peak temperature of 260 °C, the maximum temperature they can withstand. The Moisture Sensitivity Level (MSL) for the RoHS-compliant surface mount NAT9914 ASICs is 3 (the MSL is not applicable to the NAT9914BPDF through-hole device).

Ordering Information

NI NAT9914BPD (40-pin DIP package)	
RoHS-compliant	NAT9914BPDF-9
Standard	NAT9914BPD-9
Sample kit (RoHS-compliant, 2 ASICs)	776730-01
NI NAT9914BPL (44-pin PLCC package)	
RoHS-compliant.....	NAT9914BPLF-27
Standard	NAT9914BPL-27
Sample kit (RoHS-compliant, 2 ASICs)	776730-02
NI NAT9914BPQ (44-pin QFP package)	
RoHS-compliant	NAT9914BPQF-84
Standard	NAT9914BPQ-84
Sample kit (RoHS-compliant, 4 ASICs)	776730-03

Visit ni.com for a more detailed reference manual and data sheet.

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For complete product specifications, pricing, and accessory information, call (800) 813 3693 (U.S.) or go to ni.com/gpib.

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