Drop-In Replacement Chip for NEC µPD7210 Controller

NI NAT7210 *NEW!*

- RoHS-compliance option
- Register and pin-compatible with NEC µPD7210
- Software-compatible with NEC µPD7210 or TI TMS9914A controller chips
- Low-power CMOS design
- 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
- Programmable data transfer rate with T1 delays of 350 ns, 500 ns, 1.1 µs, and 2 µs
- Internal timer interrupt
- Automatic EOS and/or NL message detection
- Handles DMA transfers
- Programmatically compatible with GPIB bus transceivers (TI, National Semiconductor, Motorola, and Intel)

✓ RoHS

Overview

The National Instruments NAT7210 is a 40-pin DIP drop-in replacement part for the NEC µPD7210. The NAT7210 is 100 percent register and pin compatible with the NEC µPD7210 on power-up and has additional features in the NAT4882 IEEE 488.2 controller chip. Thus, the NAT7210 can perform all interface functions defined by ANSI/IEEE Standard 488.1-1987 and meet the additional requirements and recommendations of ANSI/IEEE Standard 488.2-1992. The NAT7210 performs complete IEEE 488 talker, listener, and controller functions.

On power-up, the NAT7210 has the complete register set of NEC µPD7210, but it has complete IEEE 488.2 controller functionality through software. Thus, you can take advantage of IEEE 488.2 with minimal software modifications, yet retain the 40-pin package and harware pin configuration. The default clock for the NAT9914 is 5 MHz and for the NAT7210 is 8 MHz; however, other input values up to 20 MHz are software selectable in the NAT7210 for increased performance. The NAT7210 can run in TI TMS9914A register-compatible mode with a software command.

If you are looking for alternatives to existing NEC µPD7210 chip suppliers or planning to upgrade your designs to IEEE 488.2 without hardware changes, you should consider using the NAT7210. Furthermore, because the NAT7210 can accept faster clock inputs, performance increases without substantially changing the firmware.
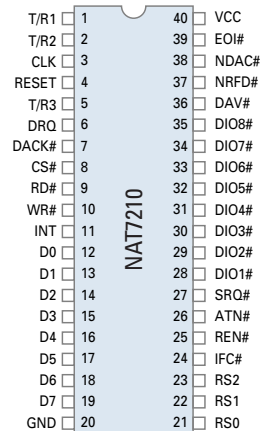
T/R1	1	40	VCC
T/R2	2	39	EOI#
CLK	3	38	NDAC#
RESET	4	37	NRFD#
T/R3	5	36	DAV#
DRQ	6	35	DIO8#
DACK#	7	34	DIO7#
CS#	8	33	DIO6#
RD#	9	32	DIO5#
WR#	10	31	DIO4#
INT	11	30	DIO3#
D0	12	29	DIO2#
D1	13	28	DIO1#
D2	14	27	SRQ#
D3	15	26	ATN#
D4	16	25	REN#
D5	17	24	IFC#
D6	18	23	RS2
D7	19	22	RS1
GND	20	21	RS0

Figure 1. NAT7210 Pin Configuration

General Architecture

The NAT7210 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 NAT7210 mode determines the function of these registers. When in 7210 mode, the registers resemble the µPD7210 register set with additional registers that supply extra functionality and IEEE 488.2 compatibility. In this mode, the NAT7210 is completely pin compatible with the NEC µPD7210. When in 9914A mode, the registers resemble the TMS9914A register set with additional registers that supply extra functionality and IEEE 488.2 compatibility.

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RoHS Compliance

The NAT7210 is currently available from NI both in a standard package and as a RoHS-compliant chip. You can order 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 NAT7210 ASICs also have a matte pure tin finish on their leads.

The RoHS-compliant NAT7210 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.

Ordering Information

NI NAT7210BPD (40-pin DIP package)

RoHS-compliant NAT7210BPDF-9

Standard NAT7210BPD-9

Sample kit (RoHS-compliant, 2 ASICs) 776730-11

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

BUY NOW!

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

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