

GX3722 SERIES



MULTI-FUNCTION I/O FPGA PXI CARD

- Multi-function Analog and Digital I/O functions
- 4 Channel Programmable Square Wave Generator
- 4 Channel Time interval Counter
- 2 Channel Function generator
- 2 Channel Digitizer
- 4 Differential TTL I/O
- PXI hybrid slot compatible



DESCRIPTION

The GX3722 is a user configurable, FPGA-based, 3U PXI card which employs a multi-function, analog / digital, I/O daughter board. The module offers multiple analog and digital source / measure capability. The daughter board interfaces to the GX3700 FPGA baseboard which employs the Altera Stratix III FPGA.

FEATURES

The GX3722 offers the following capabilities:

- 4 channel, programmable square wave generator
- 4 channel, time interval counter
- 4 differential TTL outputs
- 4 differential TTL inputs
- 2 channel function generator
- 2 channel digitizer
- 3 open collector outputs

The square wave generators can support frequencies up to 8 MHz and feature high bandwidth signal performance. The time interval analyzers employ high bandwidth comparators and can operate to 10 MHz. The function generators provide sinewave and arbitrary waveform capability. Maximum frequency of operation is 20 KHz. The two channel, 12 bit, 10 MS/s digitizer includes signal conditioning.

The module has access to all of the PXI bus resources including the PXI 10 MHz clock, the local bus, and the PXI triggers; allowing the user to create a custom instrument which incorporates all PXI bus resources. Control and access to the FPGA is provided via the GX3722's driver which includes the ability to download compiled FPGA code as well as perform register reads and writes.

PROGRAMMING AND SOFTWARE

The board is supplied with the GxFPGA library, a software package that includes a virtual instrument panel, and a Windows 32/64-bit DLL driver library and documentation. The virtual panel can be used to interactively program and control the instrument from a window that displays the instrument's current settings and status. In addition, interface files are provided to support access to programming tools and languages such as [ATEasy](#), LabVIEW, LabVIEW/Real-Time, C/C++, Microsoft Visual Basic®, Delphi, and Pascal. An On-Line help file and PDF User's Guide provides documentation that includes instructions for installing, using and programming the board.

APPLICATIONS

- Automatic Test Equipment (ATE)
- Custom interface emulation
- Custom instrumentation

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SPECIFICATIONS

DIGITAL I/O CHANNELS	
Logic Family	Differential TTL
Number of Channels	4 input, 4 output
Differential Output	Common Mode Range: 2V typical, 3 V max Differential Output Voltage: 2.25V typical, 100 ohm load Output Current: ± 10 mA Frequency: 100 KHz
Differential Input	Common Mode Range: ± 7 V Positive / Negative Threshold Voltage: 200 mV max Frequency: 100 KHz
SQUARE WAVE GENERATOR	
Number of Channels	4
Frequency	1 kHz to 8 MHz, programmable
Frequency Resolution	Integer Division of 80 MHz
Frequency Accuracy	$\pm 1\%$ of programmed value
Output Rise / Fall Time	0.5 V/ns
Output Voltage	Ch. 1: 9 Vpp, $\pm 5\%$, 50 Ohm load Ch. 2, 3: 9 Vpp, $\pm 5\%$, 75 Ohm load Ch. 4: 3 Vpp, $\pm 5\%$, 75 Ohm load
Source Impedance	Ch. 1: 50 Ohm Ch. 2-4: 75 Ohm
TIME INTERVAL MEASUREMENT	
Number of Channels	4
Max Input Frequency	10 MHz
Time Interval Measurement Resolution	5 ns
Time Interval Measurement Accuracy	10 ns
Ch. 1 Input Threshold	0.15V
Ch.2-4 input Threshold	0.3V
Maximum Input Voltage	10 Vpp
Input Impedance	Ch. 1: 50 Ohm Ch. 2-4: 75 Ohm

DIGITIZER	
Number of Channels	2
Resolution	12 bits
Input Voltage Range	24 Vpp
Analog BW	5 MHz
Input Impedance	Selectable 75 Ohm or 28 kOhm
Coupling	DC
Max Sampling Rate	10 MS/s
Sampling Rate	Programmable (S/S): 10 M, 1 M, 100 k, 10 k, 1 k
Sampling Rate Accuracy	$\pm 1\%$
WAVEFORM GENERATOR	
Number of Channels	2
Waveforms	Sine, Triangle, Sawtooth, Square, Arbitrary
Vertical Resolution	12 bits
Sampling Rate (max.)	CH1: 10 MHz CH2: 5 MHz
Sampling Rate Resolution	12.5 nS
Sampling Rate Range	$12.5 \text{ nS} * N$, $N = 8 \text{ to } 2^{32}$
Time Base	PXI 10 MHz
Output Voltage	5 Vpp, max, with 0 V offset, 50 Ohm load
Output Impedance	50 Ohm
Output Current	200 mA per channel (max)

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OPEN DRAIN CHANNELS	
Number of Channels	3
Maximum Drain / Source Voltage	50 V
Nominal Drain Current	2.0 A
Drain Current Disable Threshold	>2.5 A
TIMING SOURCES	
PXI Bus	10 MHz
Internal	80 MHz oscillator, ± 20 ppm
FPGA AND MEMORY	
FPGA Type	Altera Stratix III, EP3SL50F780
Number of PLLs	Four
Logic Elements	47.5 k
Internal Memory	1.836 Mb
On-Board Memory	256 K x 32 SSRAM
On-Board Flash	16 MB
CABLE ID	
Digital I/O Inputs	3 bits
Logic Level	TTL
POWER	
3.3 VDC	2.0 A max.
5 VDC	1.0 A max.
+12 VDC	600 mA max.
-12 VDC	400 mA max.

ENVIRONMENTAL AND PHYSICAL	
Operating Temperature Range	GX3722: 0°C to +50°C GX3722-M: 0°C to +83°C; contact factory for extended temperature range specifications
Storage Temperature	-55°C to +85°C
Relative Humidity (operating)	5% to 85%, temperature range 0°C to 60°C 5% to 60% for operating temperatures above 60°C
Altitude (operating)	4600 meters (max)
Connector	62 pin, D-sub female
Size	3U PXI, hybrid slot compatible
Weight	200 g

Note: Specifications are subject to change without notice

ORDERING INFORMATION

GX3722	PXI FPGA Multi-Function I/O Card
GX3722-M	PXI FPGA Multi-Function I/O Card - Ruggedized / Extended Temp