Symmetricom

bc824VXI

Rubidium Frequency Standard

KEY FEATURES

- Four Oscillator Modes
  - Free running
  - 10 MHz Synchronization
  - 1PPS Synchronization
  - IRIG B Synchronization
- Low Phase Noise Outputs
- 50 Nanosecond Clock Resolution
- Register/Message Based Device
- External Event Time Capture
- Programmable Periodics & Alarm
- IRIG B Output

The bc824VXI Rubidium Frequency Standard plug-in card is an ultra stable atomic oscillator supported by a C-size mainframe and resource manager configured in accordance with the VXIbus specification. The timing card will provide an ultra stable 10 MHz sine wave or TTL outputs with minimal noise. The bc824VXI employs both a rubidium oscillator and a low phase noise ovenized crystal oscillator (OCXO). The rubidium oscillator provides exceptional long term stability if the synchronizing input is lost. The OCXO phase locks to the rubidium oscillator, removing rubidium frequency spurs and providing an excellent noise floor.

The VXIbus Rubidium Frequency Standard Plug-in card is a register based device as well as a message based device. The message based interface capability will provide minimal access latency to the card via the system bus. The capability of the interrupt generation will allow interrupt driven algorithms to interface to the card. The bc824VXI will synchronize to an external 1PPS, 10 MHz reference or IRIG B time code. If the input source is lost, then time will be maintained in a flywheel state based on the on-board rubidium standard.

bc824VXI Rubidium Frequency Standard

bc824VXI Specifications

ELECTRICAL SPECIFICATIONS

- Phase noise: <-75 dBc/Hz @ 1 Hz
  <-110 dBc/Hz @ 10 Hz
  <-140 dBc/Hz @ 100 Hz
  <-150 dBc/Hz @ 1 kHz
  <-150 dBc/Hz @ 10 kHz
  <-70 dBc Overall
- Spurious: <-70 dBc Overall
- Harmonics: <-50 dBc

DISCIPLINED OSCILLATOR

- Frequency: 10 MHz
- Outputs: 10 MHz
- Rate accuracy

Stability	Allen Variance
1 sec	1E-10
10 sec	3E-11
100 sec	1E-11
Aging	
Monthly:	<5E-11
Yearly:	<5E-10
Temperature coefficient	
0°C to 50°C	3E-10
-25°C to 70°C	6E-10

(includes aging, frequency offset over temperature range, setting accuracy and 10% input voltage change)

- Accuracy at shipment: 5E-11 @ 25°C
- Frequency retrace: 5E-11 (after 1 hour power on, less than 25 hours power off)

SYNC SOURCES

- bc824VXI: Time Code, 1PPS, 10 MHz

REAL TIME CLOCK

- Bus request resolution: 100 nanoseconds
- Bus request latency: Zero
- Major time format: Binary or BCD
- Minor time format: Binary

TIME CODE TRANSLATOR

- Time code formats: IRIG B (modulated or DCLS)
- Modulation ratio: 3:1 to 6:1
- Input amplitude: 500 mV to 5 V P-P
- Input impedance: >10KΩ (AC coupled)
- Signal to noise ratio: 20 dB (minimum)

TIME CODE GENERATOR

- Time code format: IRIG B
- Modulation ratio: 3:1
- Output amplitude: 4 V P-P (fixed)
- DC level shift: TTL/CMOS

TIMING FUNCTIONS

- Heartbeat (TTL, 50Ω): Programmable periodic
  10 MHz to 3 Hz
- Event capture (TTL, 50Ω): 100 ns resolution, zero latency
- Enhanced event (TTL, 50Ω): 10 ns resolution, 50µs latency
- Event compare (TTL): Programmable, 1ms - hours
- 1PPS pulse rate (TTL, 50Ω): Positive edge on-time

ENVIRONMENTAL SPECIFICATIONS

- Temperature — **Module**
  Operating: 0°C to 70°C
  Storage: -40°C to 75°C
- Humidity
  Operating: 10% to 80%*
  Storage: 5% to 95%
  *non-condensing

VXI BUS

- Address space: A16 only
- Data transfer: Byte, Half-Word, Word
- Power:

V	Warmup	Operating
+5 VDC	2A	1A
+12	2A	0.5A
-12	0.5A	0.5A
+24	3A @ 0C	1A
-24	0.4A	0.4A

- Input voltage sensitivity: <5E-11 (D = ±10% VDC)
- Warm-up time: Time to lock <4 min (25C)
  6 minutes//1E-9

PHYSICAL SPECIFICATIONS

- Size: Double wide C-size
  (9.2 in x 13.5 in)
- Weight: 4.25 lbs
- Connector types: 8 front panel BNC outputs
  1 front panel BNC (10 MHz cal input)
  15-pin 'D' connector
  P1 & P2 per VXIbus specification
- LEDs: Power, Locked, Fault, Tracking

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