Overview

The TIC-8420 is a novel Timer/Counter/Analyzer based on digitization of time intervals in pulse trains with 2.8 ns resolution.

TIC Architecture

- Digitizes Time Intervals
- USB controlled instrument
- TTL/CMOS logic inputs/outputs
- Flexible Arming/Triggering
- Windows 10, Linux, 32/64 bit

Features

- 2.8 ns resolution, 6 ns minimum Pulse Width, 100 MHz fMax
- Two independent input channels
- External reference and trigger channels
- Jitter, Frequency, Time Interval, Pulse-width Measurements
- Two channel start/stop measurements
- Repetitive measurements: Single-Stop Histogram, Multi-Stop Histogram

Applications

- Edge Counter, Time Stamping
- Pulse-Width, Pulse, Semi-Period, Frequency, Period, Position Measurement
- Simple Pulse, Pulse Train, Frequency Generation
- Time-to-digital conversion (TDC)
- Time-of-flight (TOF) measurements

An IMPORTANT NOTICE at the end of this document addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers.
**Measurement Modes**

**MDEL** Measurement Mode

- **Input A**: ARM $T_1$ $T_2$
- **Input B**: Delay $= T_2 - T_1$

**MPWI** Measurement Mode

- **Input Signal**: ARM $T_1$ $T_2$
- **Pulsewidth**: $= T_2 - T_1$

**MPUL** Measurement Mode

- **Input Signal**: ARM $T_1$ $T_2$ $T_3$
- **PulseA**: $= T_2 - T_1$
- **PulseB**: $= T_3 - T_2$
- **DutyCycle**: $= \frac{T_2 - T_1}{T_3 - T_2}$

**MTOC** Measurement Mode

- **Input Signal**: CAPT $C_1$ $C_2$
- **Later**: $C_1$

**MFAV** Measurement Mode

- **Input Signal**: ARM $T_1$ $C_1$ $T_2$ $C_2$
- **FreqAvg**: $= \frac{C_2 - C_1}{N \cdot (T_2 - T_1)}$

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Specifications

Time Base

Stability (vs. ambient temperature): ± 3.0 ppm
Aging (first year): ± 2.0 ppm

Electrical Data

Overvoltage Protection (permanent, all inputs): -5.0V … +8.7V
Overvoltage Protection (peak, max. 10 ms, 2% duty cycle): ± 20V
Input Characteristics (Pull-down 33kΩ at each input):
Logic L ≤ 0.8V, Logic H ≥ 2.0V

Output Characteristics (low):

Output Characteristics (high):

Supply Voltage (USB): 5V ± 5%
Supply Current (USB): 150 mAR max.

Environmental and Physical

Size (excluding connectors): 111 mm L x 76 mm W x 29 mm H
Weight: 160 g
Operating ambient temperature: 0 … 50°C
Storage temperature: -20 … 80°C
Relative humidity: 5 … 95%, noncondensing
USB connector: Extraction force ≥ 15N, Mating force ≤ 35N

Ordering Information

TIC-8420 - Instrument, USB cable (1m), Software Download Card
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