FLASH ADC CARD

Introduction

A flash Analogue to Digital Converter (ADC) has been developed for high speed sampling of analogue signals. Sampling rates upto 15 MHz can be obtained.

Operating principle

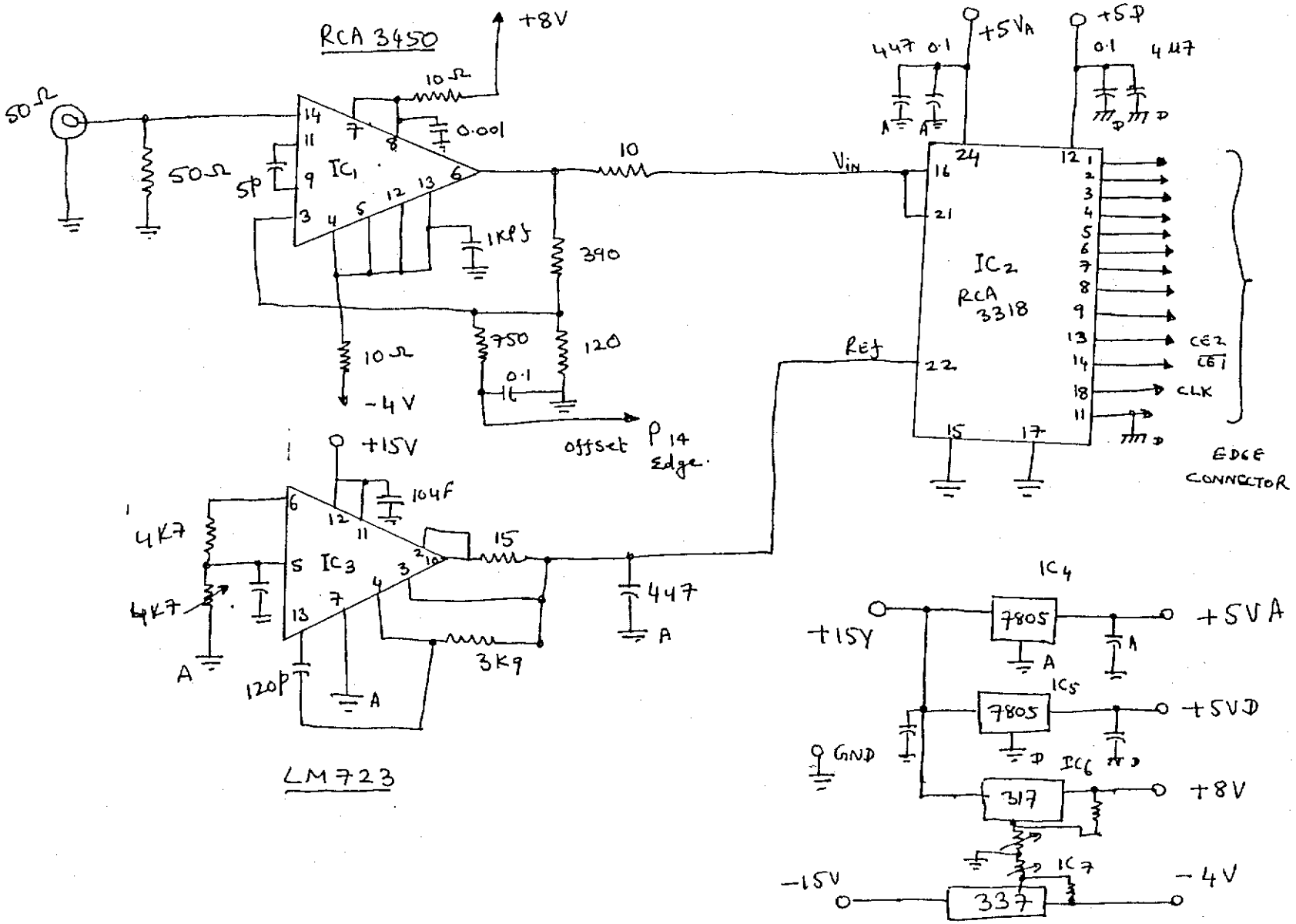
The ADC used is an RCA CA 3318 , 8 bit flash ADC. Analogue input to the ADC comes from a high speed x 5 buffer based on RCA CA 3450. The buffer has a provision for DC offset. The ADC needs an external voltage reference. This reference is obtained from high precision voltage regulator LM 723. The reference is adjustable around 5 V. Separate analogue and digital grounds are used. All grounds meet at one point close to the ADC. Separate voltage regulators are used for the analogue and digital power supplies to prevent digital noise coupling to the ADC input.Non-standard supplies are obtained using LM 317 adjustable voltage regulators. Digital outputs and power supply lines are avaliable at the edge connector. Clock source is external allowing flexibility in sampling.

Conclusion

The Flash ADC card has been used with the noise source and the PC Interface for high speed noise sampling. The sampling clock is derived from the ALE pin of the PC. A variable DC source was connected to the input of the board for evaluation. The performance with respect to linearity,sampling rate and accuracy was as per the specifications.

Appendices

1. Circuit Diagram.
2. PCB Layout of the card.
3. Brief specifications of RCA 3318.



APPENDIX 1

CIRCUIT

FLASH ANALOG DIGITAL CONVERTOR.

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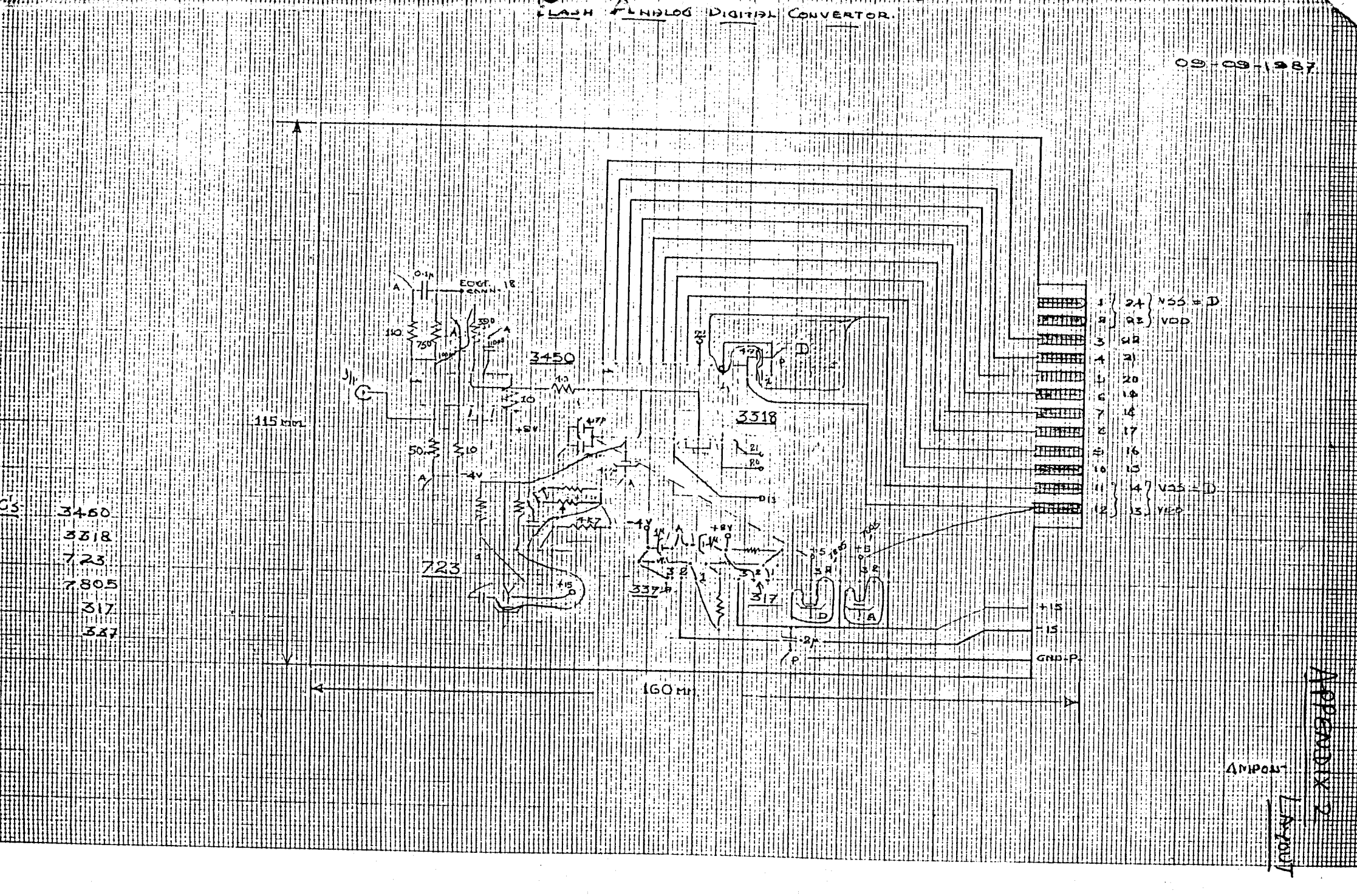


3450
3318
723
7805
317
337

APPENDIX 2

ANALOG

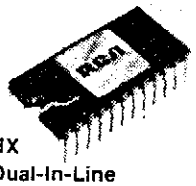
APPENDIX 3
SPECS
RCA 3318

RCA Solid State

CA3318, CA3318C

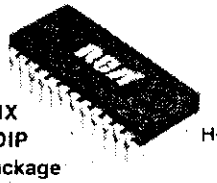
Linear Integrated Circuits

Product Preview



H-1900

(D) SUFFIX
24-Lead Dual-In-Line
Side-Brazed Ceramic Package



H-1855

(E) SUFFIX
24-Lead DIP
Plastic Package

CMOS Video Speed 8-Bit Flash Analog-to-Digital Converter

For Use in Low-Power Consumption, High-Speed Digitization Applications

Features:

- *CMOS Low power with SOS speed*
- *Parallel conversion technique*
- *15-MHz sampling rate (66-ns conversion time)*
- *8-bit latched 3-state output with overflow bit*
- *±1 LSB accuracy (typ.)*
- *Single supply voltage (4 to 7.5V)*
- *2 units in series allow 9-bit output*
- *2 units in parallel allow 30-MHz sampling rate*

The RCA CA3318* is a CMOS parallel (FLASH) analog-to-digital converter designed for applications demanding both low-power consumption and high-speed digitization.

The CA3318 operates over a wide full-scale input-voltage range of 4 volts up to 7.5 volts with maximum power consumptions depending upon the clock frequency selected. When operated from a 5-volt supply at a clock frequency of 15 MHz, the power consumption of the CA3318 is less than 150 mW.

The intrinsic high conversion rate makes the CA3318 ideally suited for digitizing high-speed signals. The overflow bit makes possible the connection of two or more CA3318's in series to increase the resolution of the conversion system. A series connection of two CA3318's may be used to produce a 9-bit high-speed converter. Operation of two CA3318's in parallel doubles the conversion speed (i.e., increases the sampling rate from 15 to 30 MHz).

256 paralleled auto-balanced voltage comparators measure the input voltage with respect to a known reference to produce the parallel-bit outputs in the CA3318.

255 comparators are required to quantize all input voltage levels in this 8-bit converter, and the additional comparator is required for the overflow bit.

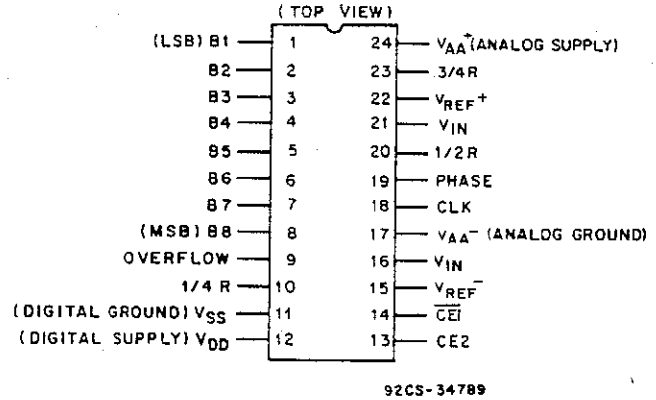
The CA3318 types are available in a 24-lead dual-in-line ceramic package (D suffix) and a 24-lead dual-in-line plastic package (E suffix).

The CA3318 is a pin-for-pin retrofit for the 41051 (CA3308), with the only major difference being output timing.

*Formerly Development Type TA13058.

Applications:

- *The CA3318 is especially suited for high-speed conversion applications where low power is also important*
- *TV video digitizing (industrial/security/broadcast)*
- *High-speed A/D conversion*
- *Ultrasound signature analysis*
- *Transient signal analysis*
- *High-energy physics research*
- *High-speed oscilloscope storage/display*
- *General-purpose hybrid ADCs*
- *Optical character recognition*
- *Radar pulse analysis*
- *Motion signature analysis*
- *μP data acquisition systems*



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TERMINAL ASSIGNMENT

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