

The SSI 33R3751A is a high performance BiCMOS integrated circuit. It contains the servo algebra functions and the channel preamplifier for an optical disk drive system. The SSI 33R3751A is available in a 48-lead TQFP package.

GENERAL

- **Single +5 V supply**
- **Uncommitted op amp available for general purpose**
- **Individual servo and data path power down pins**
- **Small footprint 48-Lead TQFP package**

- 50 MHz ROM Bandwidth
- 90 MHz MO Bandwidth
- Control line for switching between ROM and MO modes
- Differential DATA output

- 1 MHz Bandwidth
- Provides Servo tracking algebra and normalization
- Quad cell interface allows for Push-pull tracking detection
- Provides output offset adjustments through use of external resistors

The schematic diagram illustrates the internal architecture of the AD7714 ADC. It features three input buffers (TZAMP E, TZAMP F, TZAMP REF) with a gain of $A=14K$. The output of TZAMP E is connected to the non-inverting input of the DIFF AMP ($A=11$). The output of TZAMP F is connected to the inverting input of the DIFF AMP. The output of TZAMP REF is connected to the inverting input of the SUM AMP ($A=1.1$). The DIFF AMP output is connected to the non-inverting input of the BUFFER ($A=1$). The SUM AMP output is connected to the inverting input of the BUFFER. The BUFFER output is connected to the DATA+ and DATA- outputs. The circuit is powered by a 0.01µF capacitor. The schematic is labeled with various components and their gains.

BLOCK DIAGRAM - SERVO SECTION

The block diagram illustrates the servo section of a system, showing the flow of signals from inputs to outputs. The inputs on the left are TESOFF_ADJ, PPTA, PPTD, PPTB, PPTC, SSM1, GPSOFF_ADJ, GALVOG, GALVOH, SVREF2, SPWDN, VCCS, and SGND. The outputs on the right are NTES, RAWTES, TESSUM, RAW_Y, GALVOGAIN, NGGPS, RAWGPS, GPSSUM, LDRVIN, LDRVOUT, LDRVPIN, and SVREF1. The diagram includes several processing blocks: Current Buffers (I_gain = 4 for PPT inputs, I_gain = 1 for GALVO inputs), Algebra & Normalizer blocks (TES/TSUM x 1.75V, GPS/GPSSUM x 1.75V), RAW blocks (RAWTES, RAWGPS), TESSUM, and GPSSUM blocks, all with I_gain = 1. These are followed by TIA (Transimpedance Amplifier) blocks with gains of 12.5, 4, and 28.8 KΩ, and BUF (Buffer) blocks with gains of 2 and 1/6. A VREF GEN block is connected to SVREF2 and SPWDN, providing a 1.125V reference. A 3.25V reference is also shown. The diagram is watermarked with 'SAMSUNG'.

SSI 33R3751A

Preamplifier for Magneto Optical Disk Drives

FUNCTIONAL DESCRIPTION

DATA SECTION

The data section provides two transimpedance amplifiers (E and F). These are intended to be driven by photodetectors. The MO signal is generated by a difference amp while the ROM signal is generated by a sum amp. In the case of the MO two external resistive divider networks (RE1,2/RF1,2) provide a balance mechanism. The following equations describe the MO and ROM operation:

$$V_{mo} = Z_{mo}(I_{de} - I_{df})$$

$$Z_{mo} = 120 \text{ k}\Omega \text{ nominal}$$

$$\text{for } RE2/(RE1 + RE2) = RF2/(RF1 + RF2) = .67$$

$$V_{rom} = Z_{rom}(I_{de} + I_{df})$$

$$Z_{rom} = 15 \text{ k}\Omega \text{ nominal}$$

The output buffer which is multiplexed to the sum and difference amps is an emitter follower type. It has short circuit protection and is set to current limit at approximately 10 mA.

SERVO SECTION

The servo algebra signals required for optical alignment, seeking and track following are generated from 6 photo detectors A - D and G,H. The algebra is derived from sum and divide amplifiers. The divider is implemented using logarithm and anti-logarithm circuitry. All servo outputs except TESSUM and GPSSUM are referenced to SVREF1(a bandgap based voltage of 2.25 V). TESSUM and GPSSUM are referenced to _SVREF1.