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SSI 34R575
2 or 4-Channel Floppy Disk Read/Write Device

November 1991

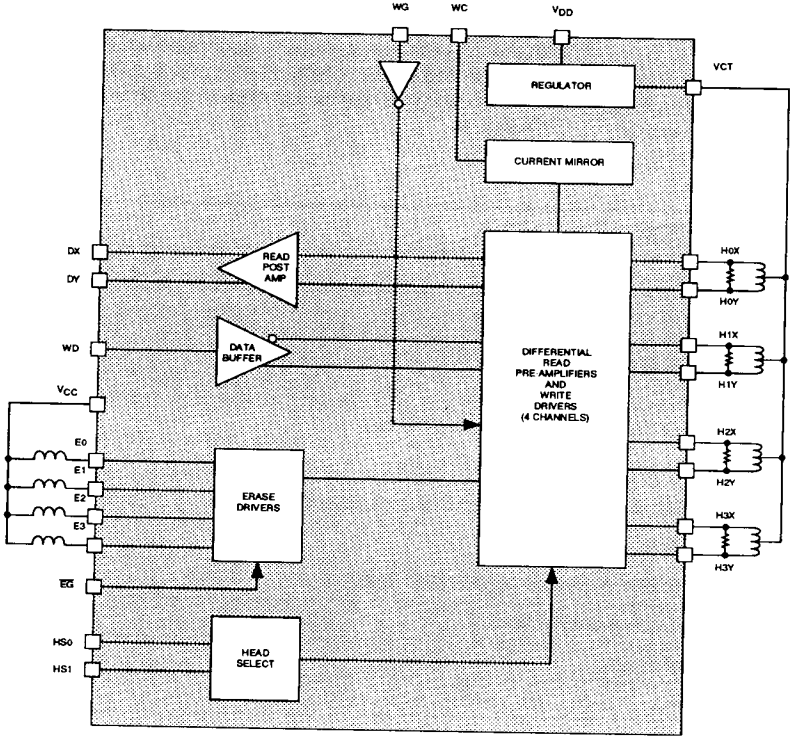
DESCRIPTION

The SSI 34R575 device is a bipolar monolithic integrated circuit used in floppy disk systems for head control and write, erase, and read select functions. The device has either two or four discrete read, write, and erase channels. Channel select inputs are TTL compatible. The SSI 34R575 device requires +5 V and +12 V power supplies and is available in 18-pin (2-channel version) or 24-pin (4-channel version) dual inline packages.

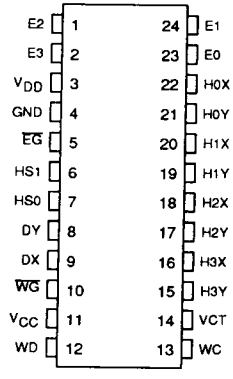
FEATURES

- **Operates on +5 V, +12 V power supplies**
- **Two or four channel capability**
- **TTL compatible control inputs**
- **Read/Write functions on one-chip**
- **Internal center tap voltage source**
- **Supports all disk sizes**
- **Applicable to tape systems**

BLOCK DIAGRAM



PIN DIAGRAM



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CAUTION: Use handling procedures necessary for a static sensitive component.

FUNCTIONAL DESCRIPTION

The SSI 34R575 functions as a write and erase driver or as a read amplifier for the selected head. Two TTL compatible inputs are decoded to select the desired read/write and erase heads. Head select logic is indicated in Table 1. Both the erase gate ($\overline{EG}$) and write gate ($\overline{WG}$) lines have internal pull up resistors to prevent an accidental write or erase condition.

MODE SELECTION

The read or write mode is determined by the write gate ($\overline{WG}$) line. The input is open collector TTL compatible. With the input low, the circuit is in the write mode. With the input high (open), the circuit is in the read mode. In the read mode, or with the +5 V supply off, the circuit will not pass write current.

ERASE

The erase operation is controlled by an open collector TTL compatible input. With erase gate ($\overline{EG}$) input high (open) or the +5 V supply off, the circuit will not pass erase current. With $\overline{EG}$ low, the selected open collector erase output will be low and current will be pulled through the erase heads.

READ MODE

With the $\overline{WG}$ line high, the read mode is enabled. In the read mode the circuit functions as a differential amplifier. The state of the head select input determines which amplifier is active. When the mode or head is switched, the read output will have a voltage level shift. External reactive elements must be allowed to recover before proper reading can commence. A current diverting circuit prevents any possible write current from appearing on a head line.

WRITE MODE

With the $\overline{WG}$ line low, externally generated write current is mirrored to the selected head and is switched between head windings by the state of the write data (WD) signal.

PIN DESCRIPTION

NAME	TYPE	DESCRIPTION
V_{CC}		+5 V
V_{DD}		+12 V
H0X-H3X H0Y-H3X		X, Y head connections
DX, DY		X, Y Read Data: Differential read signal out
WG		Write gate: sets write mode of operation
WC		Write current: current mirror used to drive floppy disk heads
WD		Write data line
EG		Erase gate: allows erasure by selected head
E0-E3		Erase head driver connections
HS0-HS1		Head select inputs
GND		Ground
VCT		Center Tap Voltage Source

TABLE 1: HEAD SELECT LOGIC

4 - CHANNELS		
HS1	HS0	HEAD
0	0	0
0	1	1
1	0	2
1	1	3

2 - CHANNELS	
HS1	HEAD
0	0
1	1

ELECTRICAL SPECIFICATIONS

ABSOLUTE MAXIMUM RATINGS
(Operating above absolute maximum ratings may damage the device.)

PARAMETER		RATING	UNIT
DC Supply Voltage:	Vcc	6.0	V
	Vdd	14.0	V
Write Current		10	mA
Head Port Voltage		18.0	V
Digital Input Voltages:	DX, DY, HS0, HS1, WD	-0.3 to + 10	V
	$\overline{EG}$, $\overline{WG}$	-0.3 to V_{cc} + 0.3	V
DX, DY Output Current		-5	mA
VCT Output Current		-10	mA
Storage Temperature Range		-65 to + 150	°C
Junction Temperature		125	°C
Lead Temperature (Soldering, 10 sec.)		260	°C

RECOMMENDED OPERATING CONDITIONS (0°C<Ta<50°C, 4.7 V<Vcc<5.3 V, 11 V<V_{DD}<13 V)

PARAMETER	CONDITIONS	MIN	NOM	MAX	UNIT
Vcc Supply Current					
Read mode	Vcc MAX			15	mA
Write mode	Vcc MAX			35	mA
V_{DD} Supply Current					
Read mode	V_{DD} MAX			25	mA
Write mode	V_{DD} MAX			15	mA
Write Current			5.5		mA

ERASE OUTPUT

PARAMETER	CONDITIONS	MIN	NOM	MAX	UNIT
Erase On Voltage	IE = 80 mA	0.7		1.3	VDC
Erase Off Leakage				100	µA

LOGIC SIGNALS

PARAMETER	CONDITIONS	MIN	NOM	MAX	UNIT
Head Select (HS0, HS1) and Write Data (WD)					
Low Level Voltage		-0.3		0.8	VDC
High Level Voltage		2.0		6.0	VDC
Low Level Current	V_{IN} = 0 volts	-1.6			mA
High Level Current	V_{IN} = 2.7 volts			40	µA
$\overline{\text{WRITE GATE}}$ ($\overline{\text{WG}}$) and $\overline{\text{ERASE GATE}}$ ($\overline{\text{EG}}$)					
Low Level Voltage		-0.3		0.81	VDC
High Level Input Current		-300			µA
Low Level Current	V_{IN} = 0 volts	-2.0			mA

READ MODE

PARAMETER	CONDITIONS	MIN	NOM	MAX	UNIT
Differential Gain	f = 100 kHz, Vin = 5 mV Rms R_L = 10 kΩ	80	100	120	V/V
Bandwidth	Vin = 5 mVRms RL = 10 K CL = 15pF	9			MHz
Input Voltage Range for 95% Linearity	f = 100 kHz, RL = 10 K	25			mVpp
Differential Input Resistance	f = 1 MHz	100			kΩ
Differential Input Capacitance	f = 1 MHz			10	pF
Input Bias Current				25	µA
Input Offset Voltage				12	mV
Output Voltage, Common Mode			8		VDC
Output Resistance				35	Ω
Output Current Sink		2			mA
Output Current Source		3			mA
Common Mode Rejection Ratio	f = 1 MHz (input referred)	50			dB
Power Supply Rejection Ratio	f = 1 MHz (input referred)	50			dB
Channel Separation	f = 1 MHz (input referred)	50			dB
Input Noise	BW = 100 Hz to 1 MHz, Z Source = 0		7		µV RMS

WRITE MODE

PARAMETER	CONDITIONS	MIN	NOM	MAX	UNIT
Write Current Gain	IW = 5.5 mA	.97		1.05	A/A
Write Current Voltage Level	IW = 5.5 mA	1.2		2.1	VDC
Differential Head Voltage	IW = 5.5 mA	12.5			VDC
Unselected Head Current	IW = 5.5 mA DC Condition			0.1	mA
Write Current Unbalance	IW = 5.5 mA			1	%
Write Current Time Symmetry	IW = 5.5 mA			±10	ns
Read Amplifier Output Level			10.5		VDC
Center Tap Voltage	(Read and Write Modes)		8.5		VDC

SWITCHING CHARACTERISTICS

PARAMETER	CONDITIONS	MIN	NOM	MAX	UNIT
Write and Erase Gate Switching Delay	Delay to 90% of Write Current			1	µsec
Head Select Switching Delay				1	µsec
Head Current Switching Delay	T1 in Fig. 1		10		nsec
Head Current Switching Time	IW = 5.5 mA Shorted Head		10	30	nsec
Write to Read Recovery Time				2	µsec

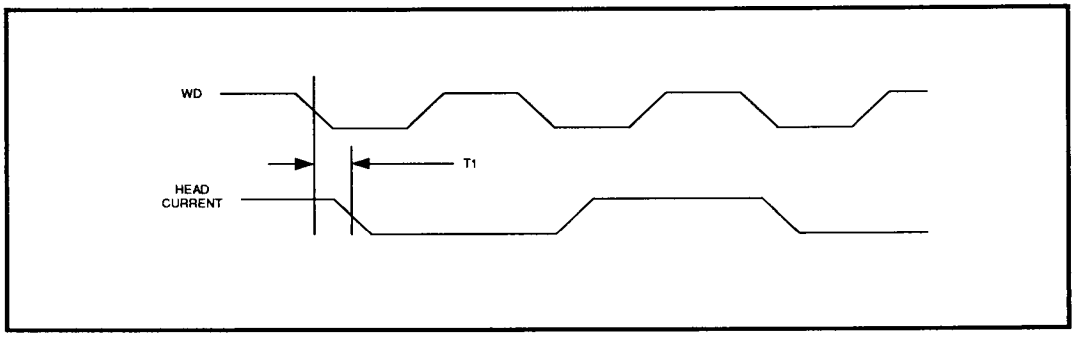
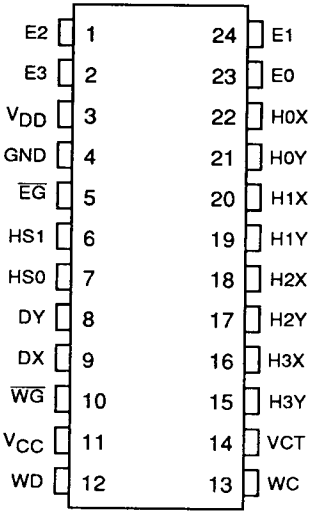
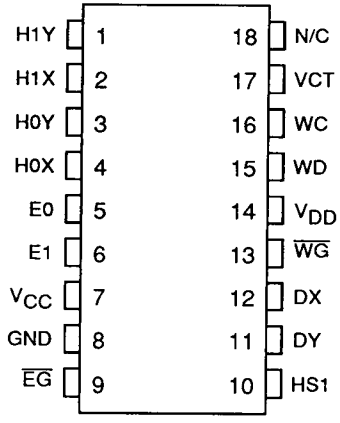


FIGURE 1: Head Current Switching Delay

PACKAGE PIN DESIGNATIONS
(TOP VIEW)



24-Pin DIP



18-Pin DIP

ORDERING INFORMATION

PART DESCRIPTION	ORDER NO.	PKG. MARK
SSI 34R575 24-Pin DIP	34R575-4CP	34R575-4CP
SSI 34R575 18-Pin DIP	34R575-2CP	34R575-2CP

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